



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

**Blean Complex Special Area of Conservation (SAC)
Site Code: UK0013697**



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About this document

This document provides Natural England's supplementary advice about the European Site Conservation Objectives relating to Blean Complex 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	Blean Complex Special Area of Conservation (SAC)
Location	Kent
Site Map	The designated boundary of this site can be viewed here on the MAGIC website
Designation Date	April 2005
Qualifying Features	See section below
Designation Area	520.62 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)	Church Woods, Blean SSSI, East Blean Woods SSSI, Ellenden Wood SSSI
Relationship with other European or International Site designations	Not applicable

Site background and geography

Blean Complex SAC is situated in south-east England within the North Kent Plain National Character Area ([NE357](#)) and is also part of [Blean Woods National Nature Reserve](#). The site comprises the largest ancient broadleaved woodland in southern Britain, situated on London Clay.

The wood comprises hornbeam *Carpinus betulus* coppice interspersed with pedunculate oak *Quercus robur* stands and introduced sweet chestnut *Castanea sativa*. Great wood-rush *Luzula sylvatica* is locally dominant in the woodland, and the characteristic greater stitchwort *Stellaria holostea* is found in more open patches. The stands have traditionally been managed as coppice, and are one of the British strongholds for the heath fritillary butterfly *Mellicta athalea*.

Many of the woodland rides have a rich flora, with such species as beautiful St John's wort *Hypericum pulchrum*, purging flax *Linum catharticum*, common centaury *Centaureum erythraea*, common spotted orchid *Dactylorhiza fuchsii* and wavy hair grass *Deschampsia flexuosa* and on the most acidic, gravelly soils ling heather *Calluna vulgaris*.

A number of small streams, flushes and ponds are present in the woods. These damper areas have a distinctive flora, often dominated by pendulous sedge *Carex pendula*. Other plants such as cuckoo flower *Cardamine pratensis*, marsh marigold *Caltha palustris* and common spotted orchid *Dactylorhiza fuchsii* are also common.

Numerous uncommon invertebrates have been recorded from this site and especially from the National Nature Reserve, including beetles, millipedes and bugs. This includes the nationally rare species- Heath

fritillary (*Mellicta athalia*); two nationally rare flies *Lophosia fasciata* and *Sytemna nitidula* and a rare beetle *Cicindela hybrida* have also been found. A good range of woodland birds are also present.

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:

- **H9160. Sub-Atlantic and medio-European oak or oak-hornbeam forests of the *Carpinion betuli*; Oak-hornbeam forests**

In south-east England there are woodland stands of oak *Quercus* spp. with some hornbeam *Carpinus betulus* that are considered closer to this central European habitat type than its Atlantic counterpart (mainly mixed Atlantic bluebell-oak forests). Bluebell *Hyacinthoides non-scripta*, which is most abundant in Atlantic parts of Europe including the UK, is unusually rare in this Annex I type. Typical species include great wood-rush *Luzula sylvatica*, hairy wood-rush *L. pilosa* and, locally, southern wood-rush *L. forsteri*, with greater stitchwort *Stellaria holostea*, ivy *Hedera helix* and honeysuckle *Lonicera periclymenum*. Stands fall within NVC type W10 *Quercus robur* – *Pteridium aquilinum* – *Rubus fruticosus* community.

At Blean in south-east England, hornbeam *Carpinus betulus* coppice occurs interspersed with pedunculate oak *Quercus robur* stands and introduced sweet chestnut *Castanea sativa*. Great wood-rush *Luzula sylvatica* is locally dominant in the woodland, and the characteristic greater stitchwort *Stellaria holostea* is found in more open patches. The stands have traditionally been managed as coppice, and are one of the British strongholds for the heath fritillary butterfly *Mellicta athalea*.

Table 1: Supplementary Advice for Qualifying Features: H9160. Sub-Atlantic and medio-European oak or oak-hornbeam forests of the *Carpinion betuli*; Oak-hornbeam forests

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Extent and distribution of the feature	Extent of the feature within the site	Maintain the total extent of the feature to a baseline-value of 97.84 hectares.	<p>There should be no measurable reduction (excluding any trivial loss) in the extent and area of this feature, and in some cases, the full extent of the feature may need to be restored. The baseline-value of extent given has been generated using data gathered from the listed site-based surveys.</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. 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.</p> <p>Where a feature is susceptible to natural dynamic processes, there may be acceptable variations in its extent through natural fluctuations. Where a reduction in the extent of a feature is considered necessary to meet the Conservation Objective for another Annex I feature, Natural England will advise on this on a case-by-case basis.</p> <p>For this feature tree roots (particularly of veteran trees) can extend a considerable distance beyond the boundary of the site - they can be impacted by soil compaction (such as caused by vehicles or construction works); agricultural operations or other soil disturbance (like trenches); and agro chemicals or other chemicals which get into the soil.</p> <p>Any loss 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 (e.g. lichens and bryophytes). Loss of any woodland area which fragments a site into different parts will clearly disturb the movement of species between the remaining parts of the woodland.</p>	<p>NATURAL ENGLAND. 2013. <i>East Blean Woods SSSI: Definitions of favourable condition for designated features (Final)</i>. Available from Natural England:</p> <p>NATURAL ENGLAND. 2012. <i>Church Woods, Blean SSSI: Definitions of favourable condition for designated features (Final)</i>. Available from Natural England:</p> <p>NATURAL ENGLAND. 2018. <i>Ellenden Wood SSSI: Definitions of favourable condition for designated features (Draft)</i>. Available from Natural England:</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Extent and distribution of the feature	Spatial distribution of the feature within the site	Maintain the distribution and configuration of the feature, including where applicable its component vegetation types, across the site	<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>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.</p> <p>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.</p> <p>There is no direct connectivity between the three SSSI's which comprise the SAC.</p>	<p>NATURAL ENGLAND. 2013. <i>East Blean Woods SSSI: Definitions of favourable condition for designated features (Final)</i>. Available from Natural England:</p> <p>NATURAL ENGLAND. 2012. <i>Church Woods, Blean SSSI: Definitions of favourable condition for designated features (Final)</i>. Available from Natural England:</p> <p>NATURAL ENGLAND. 2018. <i>Ellenden Wood SSSI: Definitions of favourable condition for designated features (Draft)</i>. Available from Natural England:</p>
Structure and function (including its typical species)	Vegetation community composition	<p>Ensure the component vegetation communities of the feature are referable to and characterised by the following National Vegetation Classification type (s):</p> <p>W10 – <i>Quercus robur-Pteridium aquilinum-Rubus fruticosus</i> woodland</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.</p> <p>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>Joint Nature Conservation Committee. 2007. <i>Second Report by the UK under Article 17 on the implementation of the Habitats Directive from January 2001 to December 2006</i>. Peterborough: JNCC. Available from: www.jncc.gov.uk/article17</p>
Structure and function (including its typical)	Vegetation structure - age class distribution	Maintain at least 3 age classes (pole stage/ medium/ mature) spread across the average life expectancy of the commonest	A distribution of size and age classes of the major site-native tree and shrub species that indicate the woodland will continue in perpetuity, and will provide a variety of the woodland habitats and niches expected for this type of woodland at the site in	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
species)		trees.	question.	Ellenden Wood SSSI East Woods SSSI Church Woods, Blean SSSI
Structure and function (including its typical species)	Vegetation structure - canopy cover	Maintain an appropriate tree canopy cover across the feature, which will typically be between 40-90% of the site	<p>Canopy cover is the overall proportion of vegetative cover consisting of any woody layer ranging from established regeneration to mature and veteran stages. Woodland canopy density and structure is important because it affects ecosystem function and in particular microclimate, litterfall, soil moisture, nutrient turnover and shading; this in turn influences the composition of plants and animals in lower vegetation layers and soil.</p> <p>Open canopies with just scattered trees will have less of a woodland character and reduced diversity of woodland-dependent species (although they may be still be important as a form of woodland-pasture. Completely closed canopies across the whole woodland are not ideal either however, as they cast heavier shade and support fewer species associated with edges, glades and open grown trees, and have little space where tree regeneration could occur.</p> <p>In general, the woodland canopy of this feature should provide a core of woodland interior conditions with some open and edge habitat as well.</p>	<p>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments</p> <p>Ellenden Wood SSSI East Woods SSSI Church Woods, Blean SSSI</p>
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 between 10-30 % of area	<p>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 should reflect the most appropriate structure for the woodland feature on a particular site, taking account of its known interest, history, past management and the landscape context.</p> <p>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</p>	<p>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments</p> <p>Ellenden Wood SSSI East Woods SSSI Church Woods, Blean SSSI</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			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 windthrow/fire/tree falling over/snow damage.	
Structure and function (including its typical species)	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 trees (typically >10 trees per hectare).	<p>Good 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.</p> <p>The targets set within this attribute should reflect the most appropriate structure for the woodland feature on a particular site, taking account of its known interest, history, past management and the 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.</p>	<p>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments</p> <p>Ellenden Wood SSSI</p> <p>East Woods SSSI</p> <p>Church Woods, Blean SSSI</p>
Structure and function (including its typical species)	Vegetation structure - dead wood	Restore, as necessary, the continuity and abundance of standing or fallen dead and decaying wood, typically 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	<p>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.</p> <p>The targets set within this attribute should reflect the most appropriate structure for the woodland feature on a particular site, taking account of its known interest, history, past management and the 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.</p>	Nash, J. and Johnson, A. 2019. <i>Blean Woods National Nature Reserve management Plan.</i>
Structure and function (including its typical species)	Vegetation structure - age class distribution	Maintain at least 3 age classes (pole stage/ medium/ mature) spread across the average life expectancy of the commonest trees.	A distribution of size and age classes of the major site-native tree and shrub species that indicate the woodland will continue in perpetuity, and will provide a variety of the woodland habitats and niches expected for this type of woodland at the site in question.	<p>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments</p> <p>Ellenden Wood SSSI</p> <p>East Woods SSSI</p> <p>Church Woods, Blean SSSI</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Structure and function (including its typical species)	Vegetation structure – shrub layer	Maintain an understorey of site native shrubs including hazel, elder, hawthorn, dogwood typically between 10-40% of the stand. Understorey species may also include sweet chestnut, ash, field maple	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 should reflect the most appropriate structure for the woodland feature on a particular site, taking account of its known interest, history, past management and the landscape context.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments Ellenden Wood SSSI East Woods SSSI Church Woods, Blean SSSI
Structure and function (including its typical species)	Vegetation structure - Woodland edge (graduated edge; buffered; mosaics with other habitats)	Maintain a graduated woodland edge into adjacent semi-natural open habitats, other woodland/wood-pasture types or scrub.	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. 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. Many typical forest species make regular use of the edge habitats for feeding due to higher herb layer productivity and larger invertebrate populations.	
Structure and function (including its typical species)	Adaptation and resilience	Maintain the resilience of the feature by ensuring a diversity of site-native trees (e.g. hornbeam, oak, ash, birch, aspen, sycamore, wild service) are present 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 SAC to climate change has been assessed by Natural England (2015) as being low, taking	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments Ellenden Wood SSSI East Woods SSSI Church Woods, Blean SSSI Natural England. 2015. Climate Change Theme Plan and supporting National Biodiversity Climate Change Vulnerability assessments ('NBCCVAs') for SACs and SPAs in England [Available at http://publications.naturalengland .

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>into account the sensitivity, fragmentation, topography and management of its habitats.</p> <p>This means that this site is considered to be vulnerable overall but are 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 advisable.</p>	<p>org.uk/publication/4954594591375360].</p>
Structure and function (including its typical species)	Browsing and grazing by herbivores	<p>Maintain browsing at a (low) level that allows well developed understorey with no obvious browse line, & lush ground vegetation with some grazing sensitive species evident (bramble, ivy etc), and tree seedlings and sapling common in gaps.</p>	<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. In general, both light grazing and browsing is desirable to promote both a diverse woodland structure and continuous seedling establishment.</p> <p>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, barkstripping and a heavily grazed sward.</p> <p>Fallow deer <i>Dama dama</i> and Muntjac deer <i>Muntiacus sp.</i> are known to be present locally however the SAC is not currently experiencing issues associated with browsing deer. Due to the fact that the establishment of a substantial population of deer would have a highly negative impact on the SAC, control measures should be undertaken before detrimental effects are realised. Grey squirrels <i>Sciurus carolinensis</i> are highly likely to be present on site, however due to their low impact, no action is required at the time of writing.</p>	<p>Nash, J. and Johnson, A. 2019. <i>Blean Woods National Nature Reserve management Plan</i>.</p> <p>Webb, J and Enfield, M. 2012. <i>East Blean Woods National Nature Reserve Management Plan 2012-2032</i></p> <p>FORESTRY COMMISSION. 2010. <i>Woodland Management Plan; Ellenden Woods</i>.</p>
Structure and function (including its typical species)	Regeneration potential	<p>Restore as necessary the potential for sufficient natural regeneration of desirable trees and shrubs; typically tree seedlings of desirable species (measured by seedlings and</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.</p>	<p>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments Ellenden Wood SSSI</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		<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;	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. Regeneration from pollarding of veteran trees should be included where this is happening.	East Woods SSSI Church Woods, Blean SSSI
Structure and function (including its typical species)	Tree and shrub species composition	Maintain a canopy and understorey of which 95% is composed of site native trees and shrubs.	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. W10: Canopy dominated by oak (usually pedunculate oak <i>Quercus robur</i>) and birch <i>Betula sp.</i> , although hornbeam <i>Carpinus betulus</i> , sweet chestnut <i>Castanea sativa</i> and lime <i>Tilia sp.</i> may be locally abundant. Ash <i>Fraxinus excelsior</i> , elm <i>Ulmus minor</i> and sycamore <i>Acer pseudoplatanus</i> are generally infrequent, but can occur with the field layer typical of this community, especially in the north and west. Plantations of non-native species may fit into this community. Shrub layer frequently contains hazel <i>Corylus avellana</i> and hawthorn <i>Crataegus monogyna</i> .	Hall, J.E., Kirby, K.J and Whitbread, A.M. 2004. <i>National Vegetation Classification: Field guide to woodland</i> . Peterborough: JNCC.
Structure and function (including its typical species)	Key structural, influential and/or distinctive species	Maintain the abundance of the typical species listed below to enable each of them to be a viable component of the Annex 1 habitat; Flora: Great wood-rush <i>Luzula sylvatica</i> is locally dominant in the woodland, and the characteristic greater stitchwort <i>Stellaria holostea</i> is found in more open	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	Hall, J.E., Kirby, K.J and Whitbread, A.M. 2004. <i>National Vegetation Classification: Field guide to woodland</i> . Peterborough: JNCC. This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments Ellenden Wood SSSI

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		<p>patches.</p> <p>Fauna:</p> <ul style="list-style-type: none"> • Heath fritillary butterfly (<i>Mellicta athalea</i>) • Nightingale (<i>Luscinia megarhynchos</i>) • Black Cap (<i>Sylvia atricapilla</i>) • Chiff chaff (<i>Phylloscopus collybita</i>) • Willow warbler (<i>Phylloscopus trochilus</i>) • Great spotted woodpecker (<i>Dendrocopos major</i>) • Garden warblers (<i>Sylvia borin</i>) • Green woodpecker (<i>Picus viridis</i>) • Lesser-spotted woodpecker (<i>Dryobates minor</i>) • Nightjar (<i>Caprimulgus europaeus</i>) • Dormouse (<i>Muscardinus avellanarius</i>) • Money spider (<i>Walckenaeria mitrata</i>) 	<p>bioturbators (mixers of soil/sediment), grazers, surface borers, predators or other species with a significant functional role linked to the habitat)</p> <ul style="list-style-type: none"> • Site-distinctive species which are considered to be a particularly special and distinguishing component of an Annex I habitat on a particular SAC. <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. 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>East Woods SSSI</p> <p>Church Woods, Blean SSSI</p> <p>Nash, J. and Johnson, A. 2019. <i>Blean Woods National Nature Reserve management Plan</i>.</p> <p>Webb, J and Enfield, M. 2012. <i>East Blean Woods National Nature Reserve Management Plan 2012-2032</i></p> <p>FORESTRY COMMISSION. 2010. <i>Woodland Management Plan; Ellenden Woods</i>.</p>
Structure and function (including its typical species)	Invasive, non-native and/or introduced species	<p>Ensure invasive and introduced non-native species are either rare or absent, but if present are causing minimal damage to the feature</p>	<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 established, the measures to control such species may also impact negatively on the features of interest (e.g. use of</p>	<p>Nash, J. and Johnson, A. 2019. <i>Blean Woods National Nature Reserve management Plan</i>.</p> <p>Webb, J and Enfield, M. 2012. <i>East Blean Woods National Nature Reserve Management Plan 2012-2032</i></p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>broad spectrum pesticides. Such species can include Rhododendrons, snowberry, Japanese knotweed, giant hogweed and Himalayan balsam, for example. Similarly, this would include pheasants, rabbits and non-native invertebrate 'pest' species.</p> <p>The density of sweet chestnut <i>Castanea sativa</i> should be reduced in Blean Woods. Where present, Rhododendron <i>Rhododendron ponticum</i>, Sycamore <i>Acer pseudoplatanus</i>, Laurel <i>Laurus nobilis</i> and Norway spruce <i>Picea abies</i> should be eradicated across the site.</p>	
Structure and function (including its typical species)	Soils, substrate and nutrient cycling	Maintain the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungal: bacterial ratio, to within typical values for the 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. 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>Virtually the entire Blean Woods complex lies on a thick shield of London Clay, often overlain by a thin drift of gravel. All the plateau areas are covered in a sandy-gravel mixture, sometimes occurring as a layer only a few centimetres thick over the clay, and often with clay as a component. It is invariably poor in nutrients and acid, often podzolic, the drainage poor to moderate depending on the size of the clay fraction.</p> <p>The Blean Woods National Nature Reserve management Plan states that innovative methods of maintaining moisture in the soils of the wood will be used.</p>	Nash, J. and Johnson, A. 2019. <i>Blean Woods National Nature Reserve management Plan</i> .
Structure and function (including its typical species)	Root zones of ancient trees	Maintain 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	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>roots, associated mycorrhizal fungi and growth.</p> <p>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.</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	<p>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.</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. 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>There are areas of deciduous woodland, good quality semi-improved grassland and ancient woodland adjacent to the SAC. The wider landscape comprises farmland and residential areas. Roads act as a barrier to connectivity between Blean Complex SAC and West Blean and Thornden Woods SSSI, which is situated to the north east of Church Woods, Blean, SSSI and Ellenden Woods SSSI and west of East Blean Woods SSSI.</p>	
Supporting processes	Air quality	Restore as necessary, the concentrations and deposition of	This habitat type is considered sensitive to changes in air quality. Exceedance of these critical values for air pollutants	More information about site-relevant Critical Loads and Levels

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(on which the feature relies)		<p>air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).</p>	<p>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 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.</p> <p>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>Nitrogen deposition exceeds the site-relevant critical load for ecosystem protection and hence there is a risk of harmful effects, but the sensitive features are currently considered to be in favourable condition on the site. This requires further investigation.</p> <p>Canterbury's Local Plan (2017) identified key issues for air quality on the SAC include the proximity of roads to sensitive habitats and the presence of physical barriers between the road and the habitat that filter air pollution. The probable impact of predicted Annual Average Daily Traffic (AADT) along the Blean Road (A290) (which is within 200m of the SAC) resulting from housing allocations in the Local Plan has been calculated using the approach set out in the Design Manual for Road and Bridges. This result concluded that there was unlikely to be a</p>	<p>for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).</p> <p>JNCC. 2015. <i>Standard Data form; Blean Complex</i>. Available from: http://jncc.defra.gov.uk/protectedsites/sacselection/n2kforms/UK0013697.pdf</p> <p>NATURAL ENGLAND. 2014. <i>Site Improvement Plan; Blean Complex</i>. Available from: file:///C:/Users/M996457/Downloads/141222FINALv1%20Blean%20Complex%20(2).pdf</p> <p>CANTERBURY CITY COUNCIL. 2017. <i>Canterbury District Local Plan</i></p> <p>Natural England. 2014. <i>Blean Complex: Site Improvement Plan</i>.</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>significant impact on the Blean SAC resulting from air pollution from increased housing, in particular nitrogen deposition. However, the Local Plan states that it is important that there are no further decreases in air quality to the detriment of sensitive parts of the site.</p> <p>Recreation levels at Blean Complex SAC will need to be monitored, but it is not currently a particular concern, due to the current access management and educational programme on this site.</p>	
Supporting processes (on which the feature relies)	Hydrology	At a site, unit and/or catchment level (as necessary, restore natural hydrological processes to provide the conditions necessary to sustain the feature within the site	<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. 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.</p> <p>This target is generic and further site-specific investigations may be required to fully inform conservation measures and/or the likelihood of impacts. This is included as 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>Blean is on high ground within a drained landscape. This is likely to be negatively affecting the 'health' of the wood and all associated flora and fauna. The soils are known to be nutrient poor leading to slow growth rates and it may be possible that the dryness is compounding the slow growth rates.</p> <p>Streams which run through the SAC are liable to dry up for several weeks during the summer and smaller streams typically only flow in winter. In addition, the impacts of climate change on the SAC are likely to include the loss of moisture through greater evapotranspiration.</p>	<p>Nash, J. and Johnson, A. 2019. <i>Blean Woods National Nature Reserve management Plan</i>.</p> <p>Webb, J and Enfield, M. 2012. <i>East Blean Woods National Nature Reserve Management Plan 2012-2032</i></p> <p>FORESTRY COMMISSION. 2010. <i>Woodland Management Plan; Ellenden Woods</i>.</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>Due to the high impacts associated with this threat, management plans across the SAC aim to investigate methods to retain moisture from watercourses.</p> <p>The Ellenden Woods Woodland Management Plan identified that diffuse pollution can result in significant impact on the water environment, reducing water quality and cause a decrease in wildlife habitat. Due to the topography of the site and the location of proposed extraction routes there is a high risk of diffuse pollution. The plan states that thinning and extraction will be undertaken in drier months to reduce the risk of occurrence.</p>	
Supporting processes (on which the feature relies)	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.	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.	
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