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

Mole Gap to Reigate Escarpment Special Area of Conservation (SAC) Site Code: UK0012804

Box Hill. Photo © Ian Capper

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About this document

This document provides Natural England's supplementary advice about the European Site Conservation Objectives relating to Mole Gap to Reigate Escarpment 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	Mole Gap to Reigate Escarpment Special Area of Conservation (SAC)
Location	Surrey
Site Map	The designated boundary of this site can be viewed here on the MAGIC website
Designation Date	1 April 2005
Qualifying Features	See section below
Designation Area	887.68 ha
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)	Mole Gap to Reigate Escarpment Site of Special Scientific Interest
Relationship with other European or International Site designations	Not applicable

Site background and geography

The Mole Gap to Reigate Escarpment SAC occupies an extensive area of the Chalk ridge which forms the escarpment of the North Downs in Surrey. There is a wide range of aspect, gradient and soil types which gives rise to a wide diversity of habitat type. A striking feature of the landscape is the very steep valley cut through the escarpment by the River Mole, giving rise to natural chalk cliffs, a rare feature in the UK. The landscape also includes an extensive area of south-facing chalk escarpment, as well as several dry valleys and elevated, gently-sloping ground on the plateau. The character of the landscape is predominantly rural and unspoilt by development.

It is a highly wooded landscape but with extensive areas of open downland, particularly on the south-facing escarpment. This landscape setting is typical of the North Downs National Character Area (NCA Profile 119). There is a wide range of soil depth and soil type ranging from very thin, highly alkaline, chalky soil through moderately nutrient-rich and moisture-retentive but still alkaline soils on the less steeply sloping areas through to poorly draining, acidic soils formed on deep deposits of Clay-with-Flints, a deposit derived from Tertiary and Cretaceous age sediments of clay-rich, silty or sandy material containing unworn flint. The steep slopes and areas of chalk scree support unusual vegetation types with an assemblage of scarce lichens. The habitat mosaic includes very species-rich chalk grassland, beech, ash and yew woodland, mixed chalk scrub including juniper, and on the plateau, an extensive area of 'chalk heath' where chalk-loving plants grow alongside those typically associated with acidic soils. There is evidence of human activity throughout the landscape with numerous ancient limekilns, mines, quarries, flint pits and sunken trackways.

Today, the area is important as a tourist destination. The site includes Box Hill which is owned and managed by the National Trust and is a popular and well known destination for walkers and cyclists. A large proportion of the site as a whole has open public access.

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:

There are six qualifying habitats for which this site is designated under article 4(4) of the Habitats Directive:

- **H5110 Stable xerothermophilous formations with *Buxus sempervirens* on rock slopes (Berberidion p.p.) Sclerophyllous scrub (matorral)**

Box Hill is one of only three locations in the UK where box *Buxus sempervirens* is considered to be native. At this site it forms extensive areas of scrub on thin, chalky soils where natural erosion maintains conditions which favour this species. Box Hill is the only location in the UK where box occurs in a more or less stable community – in other places it is usually part of a highly dynamic habitat type. This is mirrored at Box Hill where in more stable areas of the site it forms a seral stage in the development of woodland from open grassland and often persists as an understorey in beech and yew woodland, sometimes forming a dense shrub layer.

The stable box scrub formation on rock slopes association is predominantly a sub-Mediterranean habitat mainly found in rocky areas with a warm, but not excessively hot and drought-prone, climate. Most of the habitat is found in southern France and Spain. In its continental range the habitat includes a number of rare plants and animals.

There is no specific community type included in the National Vegetation Classification (NVC) which describes native box scrub. It is most closely allied to type W21 *Crataegus monogyna – Hedera helix* scrub which includes mixed chalk scrub vegetation typical of the southern Chalk.

- **H6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (this includes the priority feature "important orchid rich sites").**

The Mole Gap to Reigate Escarpment SAC includes extensive areas of species-rich, agriculturally unimproved chalk grassland which supports a wide range of orchid species. The grassland varies in character in relation to aspect, slope, soil depth and land use history but typically has a high diversity of plants strongly associated with calcareous soils. The range of variation includes very sparsely-vegetated areas on steep slopes and areas forming a transitional zone between grassland and woodland. The site supports populations of scarce orchids, most notably musk orchid *Herminium monorchis* and man orchid *Orchis anthropophora,* and also more common species such as fragrant orchid *Gymnadenia conopsea,* twayblade *Listera ovata,* autumn lady's-tresses *Spiranthes spiralis* and bee orchid *Ophrys apifera.*

The grassland types present correspond to NVC types CG2 *Festuca ovina – Avenula pratensis* grassland, CG3 *Bromus erectus* grassland. These grassland types often form a complex mosaic with areas of CG4 *Brachypodium pinnatum* grassland. In localised areas mostly associated with quarry workings there are patches of a further grassland type CG7 *Festuca ovina-Hieracium pilosella-Thymus* spp grassland.

The UK is an important stronghold for these grassland types and holds a significant proportion of the resource in the wider European context. The habitat is dependent upon regular grazing management and maintenance of low nutrient levels.

- **H91J0 *Taxus baccata* woods of the British Isles * Priority feature**

Yew is a broadly Atlantic tree with a wide but local distribution through western and central Europe, where it is most abundant in beech woods. Pure yew woods are relatively rare in Europe. ***Taxus baccata* woods of the British Isles** is restricted to the UK and Ireland.

At Mole Gap to Reigate Escarpment yew *Taxus baccata* woodland has been formed both by establishment of yew as part of the seral succession process on chalk grassland and from establishment of yew in gaps in beech *Fagus sylvatica* woodland. Yew occurs here both in extensive stands with few other associated species, or as part of a mixed woodland or scrub mosaic. In places there is an understorey of box *Buxus sempervirens*.

Yew woodland has a scattered distribution in the UK. It is mostly associated with calcareous substrates, especially over the Chalk, in the south of England.

- **H4030 European dry heaths**

A fairly substantial area of lowland dry heath is present at Headley Heath, an area on the dip slope of the plateau of the North Downs. This is a rare example of heath development over the southern Chalk. The predominantly acid-loving vegetation has developed here because of the presence of superficial deposits of Clay-with-Flints over the Chalk. These are clay-rich, gravelly deposits with low permeability which give rise to nutrient-poor, stony and wet soils. However, in places where the deposits are very shallow or where rabbit activity has brought the chalk substrate near the soil surface there can be localised neutral or alkaline soil conditions. This can produce vegetation with an intimate mixture of acid- and chalk-loving plants, a situation referred to as 'chalk heath'.

The open heath at this site has many of the typical characteristics of lowland heathland in south east England, with a community dominated by heather *Calluna vulgaris*, together with dwarf gorse *Ulex minor*, wavy hair-grass *Deschampsia flexuosa*, bell heather *Erica cinerea* and sheep's fescue *Festuca filiformis*. The localised presence of plants usually associated with alkaline soils provides additional diversity – these include salad burnet *Sanguisorba minor*, wild thyme *Thymus praecox*, carline thistle *Carlina vulgaris* and small scabious *Scabiosa columbaria*.

- **H9130 *Asperulo-Fagetum* beech forests**

Mole Gap to Reigate Escarpment SAC includes extensive areas of woodland. Much of this has been modified to varying degrees but the range of variation includes good examples of beech, ash and oak woodland typical of the southern Chalk. The woodlands vary in character and composition, related in large part to soil depth and soil chemistry. On thin, chalky soils beech *Fagus sylvatica*, ash *Fraxinus excelsior* and whitebeam *Sorbus aria* are prominent, together with hazel *Corylus avellana,* elder *Sambucus nigra* and cherry *Prunus avium.* On the plateau where soils are deeper beech and pedunculate oak *Quercus robur* are more prominent, often with an understory of holly *Ilex aquifolium.*

Qualifying Species:

- **S1323 Bechstein's bat *Myotis bechsteinii***

Bechstein's bat is one of Britain's rarest mammals and is regarded as endangered across all of its European range. The species has a wide distribution, from Iberia northwards to southern England, and eastwards to Ukraine and Moldova. The species is closely associated with mature, broadleaved woodland and has often been noted as using old woodpecker holes and rot cavities as roosting sites. The species has historically been rather poorly recorded in England and so an accurate picture of the size of the UK population and its distribution is still not fully understood. However, most populations appear to be small and vulnerable to damaging influences such as the loss of hibernation sites. Small numbers of Bechstein's bat have been regularly recorded at Mole Gap to Reigate Escarpment over an extended period, utilising underground caverns in the chalk as hibernation sites.

All species of bat present in the UK, including Bechstein's, are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of the Conservation of Habitats and Species Regulations 2017, making it a 'European Protected Species'. A Licence may therefore be required for any activities likely to harm or disturb individual bats at any time of year.

- **S1166 Great crested newt *Triturus cristatus***

The great crested newt is the largest native British newt, reaching up to around 17cms in length. Newts require aquatic habitats for breeding. Eggs are laid singly on submerged pond vegetation in spring, and larvae develop over summer to emerge in August – October, normally taking 2–4 years to reach maturity. Juveniles spend most time on land, and all terrestrial phases may range a considerable distance from breeding sites.

At the time of SAC designation, ponds at Headley Heath were regarded as supporting a "major population" of great crested newts. The breeding ponds are surrounded by a mixture of open and wooded habitats providing good terrestrial habitat for this species.

The great crested newt is fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of the Conservation of Habitats and Species Regulations 2010 (as amended), making it a 'European Protected Species'. A licence may therefore be required for any activities likely to harm or disturb great crested newts or their habitat.

References

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

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

Rodwell, JS. (ed.) 1992. British Plant Communities. Volume 3. Grassland and montane communities. Cambridge University Press.

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

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Extent and distribution of the feature	**Extent of the feature within the site**	Maintain the total extent of the feature to the baseline value of 83 hectares.	There should be no measurable reduction (excluding any trivial loss) in the extent and area of this feature. Given the historical loss of extent of the feature at this site and loss of additional areas of habitat nearby, it is desirable that the extent of open heath is increased. The baseline value of extent given is based upon the extent of open heath at the time of SAC classification and the extent of restored heath which has been established since then. The baseline area figure is approximate given the dynamic nature of the habitat but is intended to provide an indication of the extent of habitat which should be regarded as the **minimum** required to provide adequate representation of this feature. The extent of an Annex I habitat feature covers the sum extent of all of the component vegetation communities present and includes transitions and mosaics with other closely associated habitat features. Lowland heath is susceptible to natural dynamic processes and there will 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.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
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	A contraction in the range, or geographic spread, of the feature (and its component vegetation and typical species, plus transitional communities) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. This may also reduce and break up the continuity of a habitat within a site and how well its typical species are able to move around the site to occupy and use habitat. Such fragmentation can impact on their viability and the wider ecological composition of the Annex I habitat. Smaller fragments of habitat can typically support smaller and more isolated populations which are more vulnerable to	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			extinction. These conditions may not be suitable for some of the typical and more specialist species associated with the Annex I habitat feature.	
Structure and function (including its typical species)	**Vegetation community composition**	Ensure the component vegetation communities of the feature are referable to and characterised by the following National Vegetation Classification types: • H2 *Calluna vulgaris – Ulex minor* heath • Mosaics of H2 and acid grassland of type U1 *Festuca ovina-Agrostis capillaris-Rumex acetosella* grassland	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. This will also help to conserve their typical plant species (i.e. the constant and preferential species of a community), and therefore that of the SAC feature, at appropriate levels (recognising natural fluctuations). It should be noted however that many parts of the habitat at Headley Heath are in the process of restoration following encroachment of bracken and scrub and it may take a long time for the vegetation to regain the characteristics of the 'target' habitat types.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	**Vegetation community transitions**	Maintain or restore as necessary areas of transition between this and communities which form other heathland-associated habitats, such as acid grassland, scrub and woodland.	Transitions/zonations between adjacent but different vegetation communities are usually related to naturally-occurring changes in soil, aspect or slope. Such 'ecotones' retain characteristics of each bordering community and can add value in often containing species not found in the adjacent communities. Retaining such transitions can provide further diversity to the habitat feature, and support additional flora and fauna. This is an important attribute as many characteristic heathland species utilise the transitions between vegetation types or use different vegetation types during different stages of their life cycle or behavioural aspects. For example, heathland birds will utilise open heath, dense scrub and woodland edge for nesting, feeding and exhibiting territorial behaviour.	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)
Structure and function (including its typical species)	**Vegetation structure: cover of dwarf shrubs**	Maintain or restore as necessary an overall cover of dwarf shrub species which is typically between 25-90%	Variation in the structure of the heathland vegetation (vegetation height, amount of canopy closure, and patch structure) is desirable to maintain high niche diversity and hence high species richness of characteristic heathland plants and animals. Many species also utilise the transitions between vegetation types or use different vegetation types during different stages of their life cycle. The structural character of the heathland feature is strongly influenced by the presence of heathers and dwarf gorse. A high cover of these plants will usually indicate good habitat condition and appropriate management to maintain the feature in the long term.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	**Vegetation composition: bracken cover**	Maintain or restore as necessary a cover of dense bracken which is low, typically at <10%	The spread and increasing dominance of bracken *Pteridium aquilinum* has resulted in the historical loss of extent of open heath at this site and has resulted in degradation of the habitat. This is a common problem on many lowland heathlands. The unpalatable nature and density of bracken as a tall-herb fern, and its decomposing litter, can smother and shade out low-growing plants and accumulation of leaf litter can alter the nature of the substrate to such an extent that it can no longer support characteristic heathland plants. In most cases active management of bracken is required to reduce or contain its cover across this habitat feature. Where it has been present as a dense canopy for a pronged period habitat restoration may be required to re-establish suitable conditions for heather and dwarf gorse. However, the value of the bracken-dominated habitat should be taken into consideration – this can be a valuable component of the wider habitat mosaic.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	**Vegetation structure: cover of gorse**	Maintain or restore as necessary cover of common gorse *Ulex europaeus* at <10%	Common gorse is a valuable wildlife habitat and is an important component of lowland heaths. Both dense and spiny, it provides good, protected cover for many wildlife species: birds, mammals and reptiles; breeding habitat for rare bird species, and excellent winter roosting. The flowers, borne at a time of year when other sources of pollen or nectar are in short supply, are particularly good for insects and other invertebrate pollinators. However common gorse may cause problems if	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)
			unchecked by dominating an area, eliminating other typical heathland species and mature stands can present a serious fire hazard. Ideally, gorse should be present as widely scattered, structurally varied, dense, small clumps.	
Structure and function (including its typical species)	**Vegetation structure: tree cover**	Maintain or restore as necessary the open character of the feature, with a typically scattered and low cover of trees and scrub (<20% cover)	Scrub (mainly trees or tree saplings above 1 m in height) and isolated trees are an important component of lowland heaths. They provide warmth, shelter, cover, foodplants, perches, territorial markers and sources of prey for heathland invertebrates and vertebrates. Many typical lowland heathland invertebrates are dependent upon the availability of dead wood provided by mature trees or fallen timber. However, encroachment by scrub and trees is a serious threat to heaths. Tree and shrub cover should be maintained or restored to a fairly sparse level, with a structurally complex edge and with characteristic heathland vegetation as ground cover. The overall extent of shrub and tree cover should be stable or at least not increasing to the detriment of open heath.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	**Vegetation structure: heather age structure**	Maintain or restore as necessary a diverse age structure of heather and dwarf gorse	The availability of a range of age classes of dwarf shrubs provides a wide diversity of habitat conditions suitable for a range of different species. High structural diversity creates a wide range of microclimatic conditions. Conversely, a structurally uniform cover of dwarf shrubs will generally result in low overall biodiversity and may significantly increase fire-risk. It is therefore important to maintain a mosaic of heather and dwarf gorse in different phases of growth. Ideally, this age structure will consist of between 10-40% cover of (pseudo) pioneer heather; 20-80% cover of building/mature heather; <30% cover of degenerate heather and less than <10% cover of dead heather. Historically, this diversity would have been achieved through utilisation of heather by cutting for animal bedding or as fuel and/or by grazing. In a modern context this may require a range of management inputs such as grazing/cutting/turf-stripping or controlled burning.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical	**Vegetation: undesirable species**	Restore the frequency and cover of the following undesirable species to <1% and prevent changes in surface condition,	Lowland heaths represent the early stage of seral succession which typically ends with the development of closed canopy woodland, which will in most cases, result in the loss of the suitability of the habitat for a wide range of reptiles,	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)		soils, nutrient levels or hydrology which may encourage their spread: Birch *Betula* spp, Oak *Quercus* spp, Sweet chestnut *Castanea sativa*, Bramble *Rubus fruticosus*, *Rhododendron ponticum*, *Gaultheria shallon,* ragwort, nettle, thistles and other injurious weeds, negative indicators such as foxglove *Digitalis purpurea,* rosebay willowherb *Chamerion angustifolium* and coarse grasses such as cocksfoot *Dactylis glomerata.*	invertebrates, birds and plants. Control of the establishment and development of woody vascular plants species may require active management to avert an unwanted succession to a different and less desirable state. Often they may be indicative of a negative trend relating to another aspect of a site's structure and function. These species will vary depending on the nature of the particular feature, and in some cases these species may be natural/acceptable components or even dominants.	
Structure and function (including its typical species)	**Key structural, influential and/or distinctive species**	Maintain or restore as necessary the abundance of the typical species listed below to enable each of them to be a viable component of the Annex 1 habitat: • Constant and preferential plant species of the H2 *Calluna vulgaris – Ulex minor* heath and U1 *Festuca ovina-Agrostis capillaris-Rumex acetosella* grassland NVC vegetation types at this SAC	Some plant or animal species (or related groups of such species) make a particularly important contribution to the necessary structure, function and/or quality of an Annex I habitat feature at a particular site. These species will include; • **Structural** species which form a key part of the Annex I habitat's structure or help to define that habitat on a particular SAC (see also the attribute for 'vegetation community composition'). • **Influential** species which are likely to have a key role affecting the structure and function of the habitat (such as bioturbators (mixers of soil/sediment), grazers, surface borers, predators or other species with a significant functional role linked to the habitat) • **Site-distinctive** species which are considered to be a particularly special and distinguishing component of an Annex I habitat on a particular SAC. There may be natural fluctuations in the frequency and cover of each of these species. The relative contribution made by them to the overall ecological integrity of a site may vary, and Natural	Nature Conservancy Council 1983 Mole Gap to Reigate Escarpment SSSI - Habitat descriptions (used to support the revision of the SSSI designation in 1986). Natural England file.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			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.	
Structure and function (including its typical species)	**Functional connectivity with wider landscape**	Maintain or restore as necessary 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 desirability of maintaining or restoring the connectivity of the site to its wider landscape in order to meet the conservation objectives. Historical maps dating from the late 19th century demonstrate that Headley Heath was once part of a much larger complex of heaths and heathy woods on the plateau of the North Downs. Whilst it is acknowledged that it is no longer practical to seek to restore or re-create heathland over most of this area it is important that there is some degree of functional habitat connectivity across the landscape which provides opportunities for species to move between habitat patches. 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 important for the migration, dispersal and genetic exchange of those species associated with the qualifying Annex I habitat features of the site. These features may also be important to the operation of the supporting ecological processes on which the designated site and its features may rely, such as the dispersal of great crested newts. 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.	
Structure and function (including its typical species)	**Adaptation and resilience**	Maintain or restore as necessary the feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site	This recognises the increasing likelihood of natural habitat features to absorb or adapt to wider environmental changes. Resilience may be described as the ability of an ecological system to cope with, and adapt to environmental stress and change whilst retaining the same basic structure and ways of functioning. Such environmental changes may include changes in sea levels, precipitation and temperature for example, which are likely to affect the extent, distribution,	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)
			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 into account the sensitivity, fragmentation, topography and management of its habitats. 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.	org.uk/publication/4954594591375360]. NERC 2016 Climate Change Impact Report Cards.
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.	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.	
Supporting processes (on which the feature relies)	**Conservation measures**	Maintain or restore as necessary the management measures (either within and/or outside the site boundary as appropriate) which are necessary to maintain the structure, functions and supporting processes associated with the feature	Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site. Further details about the necessary conservation measures for this site can be provided by contacting Natural England. This information will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, Site Management Strategies or Plans, the Views about Management Statement for the underpinning SSSI and/or management agreements. Of particular importance is the need to maintain low nutrient	Views about Management document: https://designatedsites.naturalengland.org.uk/PDFsForWeb/VAM/1000977.pdf

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			levels, high structural diversity at large and small scales, and to prevent seral development to closed canopy woodland. These objectives will usually require a combination of management techniques such as grazing, bracken control, manual scrub cutting, heather mowing, and creation of bare ground.	
Supporting processes (on which the feature relies)	**Air quality**	Maintain or restore as necessary the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	This habitat type is considered sensitive to changes in air quality. Exceedance of these critical values for air pollutants may modify the chemical status of its substrate, accelerating or damaging plant growth, altering its vegetation structure and composition and causing the loss of sensitive typical species associated with it. Critical Loads and Levels are recognised thresholds below which such harmful effects on sensitive UK habitats will not occur to a significant level, according to current levels of scientific understanding. There are critical levels for ammonia (NH3), oxides of nitrogen (NOx) and sulphur dioxide (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.	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).
Supporting processes (on which the feature relies)	**Water quality and quantity**	Where the feature is dependent on surface water and/or groundwater flow, maintain water quality and quantity to a standard which provides the necessary conditions to support the feature, i.e. low nutrient status, pH <7.	The lowland heath habitat at Headley Heath exhibits a degree of variation related to soil wetness. Areas of the site with impeded drainage have a distinctive composition with increased frequency of purple moor-grass *Molinia caerulea*, common bent *Agrostis capillaris* and rush *Juncus* species. This natural variation provides additional habitat diversity which will increase the suitability of the habitat for reptiles, wetland invertebrates and birds.	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			Maintaining the quality and quantity of water supply will be important. In this case, given that surface wetness is likely to be related to rainfall rather than groundwater flow, this may only require on-site safeguards to protect water supply and water quality. Poor water quality and inadequate quantities of water will adversely affect the structure and function of this habitat type.	
Version Control Advice last updated: N/A				
Variations from national feature-framework of integrity-guidance: N/A				

Table 2: Supplementary Advice for Qualifying Features: H5110. Stable xerothermophilous formations with *Buxus sempervirens* on rock slopes (Berberidion p.p.); Natural box scrub

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 at least a baseline value of 8.4 hectares.	There should be no measurable net reduction (excluding any trivial loss) in the extent and area of this feature. The baseline value of extent is taken from a field survey report which notes that the area figure stated is somewhat misleading as it is a very steeply-sloping area of land, including chalk cliffs. The figure is approximate and may be revised in the light of more accurate data. The extent of an Annex I habitat feature covers the sum extent of all of the component vegetation communities present and includes transitions and mosaics with other closely-associated habitat features. Where a feature is susceptible to natural dynamic processes, there may be acceptable variations in its extent through natural fluctuations. Where a reduction in the extent of a feature is considered necessary to meet the Conservation Objective for another Annex I feature, Natural England will advise on this on a case-by-case basis.	Groome G 2004 National Vegetation Classification Survey of Mole Gap to Reigate Escarpment cSAC Survey Area 1. Report commissioned by Natural England (Available from Natural England on request) This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
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	The stable box scrub feature is restricted to the area known as The Whites on the steep slopes above the River Mole. Box is common and widespread in other areas of the SAC but it is only in the vicinity of The Whites that the vegetation can be described as 'stable' in that natural erosion prevents seral development of the scrub habitat to woodland. In theory at least, allowing these natural processes to continue should be sufficient in order to maintain the extent and distribution of the stable box scrub habitat.	Groome G 2004 National Vegetation Classification Survey of Mole Gap to Reigate Escarpment cSAC Survey Area 1. Report commissioned by Natural England. (Available from Natural England on request)
Structure and function (including its typical species)	**Vegetation structure - age class**	Maintain a population of Box (*Buxus sempervirens*) comprising plants at different life stages from seedlings to mature shrubs.	This refers to the stable box scrub feature at The Whites. Allowing natural processes to occur here should provide suitable conditions for natural reproduction of box.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function	**Vegetation community**	Ensure the component vegetation communities of the	The stable box scrub feature is confined to this single location in the UK and is not included in the National Vegetation	This attribute will be periodically monitored as part of Natural

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
(including its typical species)	**composition**	feature are typical of the habitat type.	Classification system. Allowing natural processes to proceed on the steep slopes where it occurs should provide suitable conditions for the maintenance of its characteristic composition. This will include transitions to other habitat types, particularly mixed chalk scrub and yew woodland. There may be acceptable natural fluctuations in composition related to natural processes of erosion.	England's SSSI Condition Assessments
Structure and function (including its typical species)	**Resilience of the feature to plant disease**	Maintain the resilience of the feature to resist diseases such as box blight	'Box blight' is caused by at least two fungal pathogens. It results in bare patches and dieback of box. It is a relatively new disease in the UK and its effects on native wild box vegetation is not yet known. Box is also susceptible to the box tree moth *Cydalima perspectalis*. This moth is native to south east Asia but has been accidentally spread to Europe where it is invasive and damaging. The box tree moth has been found in the London and Surrey areas but its effects on native wild box are not yet clear. However, control measures would be extremely difficult to achieve given the very steeply sloping ground that supports the feature at The Whites.	
Structure and function (including its typical species)	**Regeneration potential**	Maintain the site's capacity for natural tree and shrub regeneration.	The ability of box to reproduce must be maintained if the feature is to be sustained. In this case, opportunities for seedling establishment are provided by natural erosion of the steep slopes and allowing natural process to proceed should be sufficient to meet this objective.	
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: Box *Buxus sempervirens* Hawthorn *Crataegus monogyna*, Wild privet *Ligustrum vulgare* Yew *Taxus baccata* Beech *Fagus sylvatica* Common whitebeam *Sorbus aria*	Some plant or animal species (or related groups of such species) make a particularly important contribution to the necessary structure, function and/or quality of an Annex I habitat feature at a particular site. These species will include; • **Structural** species which form a key part of the Annex I habitat's structure or help to define that habitat on a particular SAC (see also the attribute for 'vegetation community composition'). • **Influential** species which are likely to have a key role affecting the structure and function of the habitat (such as bioturbators (mixers of soil/sediment), grazers, surface borers, predators or other species with a significant functional role	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			linked to the habitat) • **Site-distinctive** species which are considered to be a particularly special and distinguishing component of an Annex I habitat on a particular SAC. There may be natural fluctuations in the frequency and cover of each of these species. The relative contribution made by them to the overall ecological integrity of a site may vary, and Natural England will provide bespoke advice on this as necessary. The list of species given here for this Annex I habitat feature at this SAC is not necessarily exhaustive. The list may evolve, and species may be added or deleted, as new information about this site becomes available. The objective here is to seek to ensure that the stable box scrub feature continues to exhibit its characteristic natural composition. This should be achievable by allowing natural processes to continue.	
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.	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.	
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, watercourses and verges, outside of the designated site boundary which are either important for the migration, dispersal and genetic exchange of those typical species closely associated with qualifying Annex I habitat features of the site. These features may also be important to	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			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.	
Supporting processes (on which the feature relies)	**Air quality**	Restore as necessary the concentrations and deposition of 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).	See the supporting notes for this attribute above in Table1.	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).
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.	
Version Control Advice last updated: N/A				
Variations from national feature-framework of integrity-guidance: N/A				

Table 3: Supplementary Advice for Qualifying Features: H6210. Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia) (important orchid sites); Dry grasslands and scrublands on chalk or limestone (important orchid sites) *

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 or restore as necessary the total extent of the feature to at least a baseline value of 114.7 hectares.	There should be no measurable reduction (excluding any trivial loss) in the overall extent of this feature. Given the historical loss of extent of grassland at this site and fragmentation of the resource as a result of scrub encroachment and development of woodland it is desirable that the overall extent is increased where appropriate (i.e. will not result in a loss of an important habitat feature). In common with most areas of downland on the North Downs the former extent of agriculturally unimproved grassland has declined significantly since the 1940s due to changes in the agricultural economy, the decline of grazing and periods of management neglect. The objective is to halt this loss and to restore species-rich grassland where it will have reasonable likelihood of success and greatest benefit for wildlife. The baseline value of extent given has been generated using data gathered from various sources and mapped as 'Priority Habitat lowland calcareous grassland' on Webmap/MAGIC. It is subject to review and revision subject to corrections or alterations to the dataset. In many parts of the site there is a dynamic interface between grassland and scrub and the extent of open habitat will vary over time in response to habitat management. As the objective is to ensure there is no net loss of grassland extent loss of area in one part of the site may be acceptable if there are gains elsewhere, assuming that this is in tune with the overarching nature conservation objectives. 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.	Groome G 2004 National Vegetation Classification Survey of Mole Gap to Reigate Escarpment cSAC Survey Area 1. Report commissioned by Natural England. 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)
Extent and distribution of the feature	**Spatial distribution of the feature within the site**	Maintain or restore as necessary the distribution and configuration of the feature, including where applicable its component vegetation types, across the site	There should be no significant decline in the spatial distribution of the unimproved grassland habitat across the site. Indeed, given the historical loss and contraction of the resource it is desirable that grassland is restored where it will improve habitat linkage and protect against the risk of species becoming isolated in patches. A contraction in the range, or geographic spread, of the feature (and its component vegetation and typical species, plus transitional communities) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. This may also reduce and break up the continuity of a habitat within a site and how well its typical species are able to move around the site to occupy and use habitat. Such fragmentation can impact on their viability and the wider ecological composition of the Annex I habitat. Smaller fragments of habitat can typically support smaller and more isolated populations which are more vulnerable to extinction.	Groome G 2004 National Vegetation Classification Survey of Mole Gap to Reigate Escarpment cSAC Survey Area 1. Report commissioned by Natural England.
Structure and function (including its typical species)	**Vegetation community composition**	Ensure the component vegetation communities of the feature are referable to and characterised by the following National Vegetation Classification types: • CG2 *Festuca ovina – Avenula pratensis* grassland • CG3 *Bromus erectus* grassland • CG4 *Brachypodium pinnatum* grassland • CG7 *Festuca ovina-Hieracium pilosella-Thymus* spp grassland	This habitat feature is comprised of 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. This will also help to conserve their typical plant species (i.e. the constant and preferential species of a community), and therefore that of the SAC feature, at appropriate levels (recognising natural fluctuations). It is important to note that the abundance and distribution of tor grass *Brachpodium pinnatum*, which characterises the CG4 NVC type, has increased significantly since the 1980s as a result of lapses in grazing management and management	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)
			neglect, perhaps exacerbated by climate change and aerial pollution. This plant can cause a decline in plant diversity and overall habitat suitability for invertebrates where its growth is unchecked as it can shade out and out-compete lower growing plants adapted to the typical short turf of traditionally-managed chalk downland. Where it is already well-established it is impractical to seek to control the spread of this plant but a basic management objective should be to maintain those areas as the CG4a variant of the community type, which is the most species-rich and ecologically valuable variant.	
Structure and function (including its typical species)	**Vegetation: proportion of herbs (including *Carex* spp)**	Maintain or restore where necessary the proportion of herbaceous species to grasses within the range 40%-90%	A high cover of characteristic herbs, including sedges (*Carex* species) is typical of the structure of this habitat type and is indicative of good management.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	**Key structural, influential and/or distinctive species**	Maintain or restore where necessary the abundance of the typical species listed below to enable each of them to be a viable component of the Annex 1 habitat: • Constant and preferential plant species of the CG2 *Festuca ovina – Avenula pratensis grassland*, CG3 *Bromus erectus* grassland, CG4 *Brachypodium pinnatum* grassland and CG7 *Festuca ovina-Hieracium pilosella-Thymus* spp grassland NVC vegetation types at this SAC • Juniper Juniperus communis • Vascular plant assemblage	Some plant or animal species (or related groups of such species) make a particularly important contribution to the necessary structure, function and/or quality of an Annex I habitat feature at a particular site. These species will include; • **Structural** species which form a key part of the Annex I habitat's structure or help to define that habitat on a particular SAC (see also the attribute for 'vegetation community composition'). • **Influential** species which are likely to have a key role affecting the structure and function of the habitat (such as bioturbators (mixers of soil/sediment), grazers, surface borers, predators or other species with a significant functional role linked to the habitat) • **Site-distinctive** species which are considered to be a particularly special and distinguishing component of an Annex I habitat on a particular SAC. There may be natural fluctuations in the frequency and cover of each of these species. The relative contribution made by them	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)
		including Man orchid *Orchis anthropophora,* Musk orchid *Herminium monorchis*, Early gentian *Gentianella anglica*, Cut-leaved germander *Teucrium botrys*, Wild liquorice *Astragalus glycyphyllos*, Wild candytuft *Iberis amara*, Round-headed rampion *Phyteuma tenerum*, Meadow clary *Salvia pratensis*, Glandular eyebright *Euphrasia anglica* • Invertebrate assemblage including Adonis blue *Lysandra belargus,* Silver-spotted skipper *Hesperia comma*, Straw belle moth *Aspitates gilvara*, Hornet robberfly *Asilus crabroniformis*, Hazel leaf-beetle *Cryptocephalus coryli*	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.	
Structure and function (including its typical species)	**Vegetation: undesirable species**	Maintain or restore as necessary the frequency and cover of the following undesirable species to within acceptable levels and prevent changes in surface condition, soils, nutrient levels or hydrology which may encourage their spread: *Cotoneaster* spp, Butterfly bush *Buddleja davidii*, Tor grass *Brachypodium pinnatum*	'Undesirable' species are those which, if allowed to spread and increase in abundance, are likely to have an adverse effect on the feature's structure and function, including its more desirable typical species. These will include both invasive non-native plants and coarse and aggressive native species which may uncharacteristically dominate the composition of the feature if not kept in check.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	**Vegetation community transitions**	Maintain or restore as necessary the pattern of natural vegetation zonations/transitions, particularly the 'scrub edge' transition between grassland and	Many of the special and distinctive species associated with the grassland habitat at this site are found in or utilise the transitional areas between grassland, scrub and woodland, eg man orchid and hazel leaf-beetle. Where most valuable these transitions have high structural diversity, some protection from	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		woodland.	grazing animals, shelter and a warm microclimate. The retention of this transitional zone can be challenging because of the dynamic nature of the feature but may be of critical importance for many species.	
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.	Soil is the foundation of basic ecosystem function and 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. The natural variation in soil composition and depth which is typical of the Chalk landscape is important in providing the basis for variation in grassland composition. Chalk soils are naturally limited in available nutrients and can be vulnerable to compaction. It is therefore important to protect chalk soils from activities which will result in or exacerbate soil erosion, increase nutrient status or cause compaction.	
Structure and function (including its typical species)	**Supporting off-site habitat**	Maintain or restore where necessary the extent, quality and spatial configuration of land or habitat surrounding or adjacent to the site which is known to support the feature, particularly adjacent areas of permanent grassland.	The structure and function of the qualifying habitat, including its typical species, will rely to varying degrees upon the continued presence of areas which surround and are outside of the designated site boundary. Changes in surrounding land-use may adversely (directly or indirectly) affect the functioning of the feature and its component species. This supporting habitat may be critical to the typical species of the feature to support their feeding, breeding, roosting, population dynamics ('metapopulations'), pollination or to prevent/reduce/absorb damaging impacts from adjacent land uses e.g. pesticide drift, nutrient enrichment. For example, the hornet robberfly is dependent upon cattle- or horse-grazed pasture with dung present for large parts of the year to provide larval habitat but need unimproved grassland with abundant insect prey during the adult stage. The availability of grazing land close to the SAC may also be important to support a viable livestock grazing system to	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			maintain the grassland feature in good condition.	
Structure and function (including its typical species)	**Functional connectivity with wider landscape**	Maintain or restore as necessary the overall extent, quality and function of any supporting features within the local landscape which provide a critical functional connection with the site	The landscape of the North Downs has suffered from a significant historical loss of natural habitats and fragmentation of the remaining habitat resource through housing development, road building, conversion of land to golf courses and natural succession of grassland and heath to woodland. It is important that this is recognised when considering means of maintaining connectivity of the site to its wider landscape in order to meet the conservation objectives. These connections may take the form of landscape features, such as habitat patches, hedges, watercourses and verges, outside of the designated site boundary which are either important for the migration, dispersal and genetic exchange of those typical species closely associated with qualifying Annex I habitat features of the site. These features may also be important to the operation of the supporting ecological processes on which the designated site and its features may rely. In most cases increasing actual and functional landscape-scale connectivity would be beneficial. Where there is a lack of detailed knowledge of the connectivity requirements of the qualifying feature, Natural England will advise as to whether these are applicable on a case by case basis.	
Structure and function (including its typical species)	**Adaptation and resilience**	Maintain or restore as necessary the feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site	See the supporting notes for this attribute above in Table1.	
Supporting processes (on which the feature relies)	**Air quality**	Maintain or restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	See the supporting notes for this attribute above in Table1.	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Supporting processes (on which the feature relies)	**Conservation measures**	Maintain or restore as necessary the management measures (either within and/or outside the site boundary as appropriate) which are necessary to maintain the structure, functions and supporting processes associated with the feature	Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site. In particular, regular grazing is essential in order to maintain chalk grassland in good condition. This provides the necessary structural conditions at a large and small scale which are of critical importance in maintaining habitat suitability for the associated specialised species. Indeed, there are specific grazing techniques that are important to ensure that the grassland feature is maintained in good condition, related to timing of grazing, type of grazing stock, grazing intensity and supplementary aspects such as rabbit management. In most cases, grazing management must be supplemented by management of scrub encroachment and it may also be necessary to consider the control of undesirable species such as tor grass. Highly specific management measures may be required in order to secure the conservation of species with very specific habitat requirements, such as juniper, straw belle, man orchid and meadow clary. Many of the plants and animals which make this site special are present as very small, isolated populations which are highly vulnerable to local extinction and so management which maintains the ability of these species to expand their range across the site will be particularly important. Further details about the necessary conservation measures for this site can be provided by contacting Natural England. This information will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, Site Management Strategies or Plans, the Views about Management Statement for the underpinning SSSI and/or management agreements.	Mole Gap to Reigate Escarpment SSSI Views about Management document: https://designatedsites.naturalengland.org.uk/PDFsForWeb/VAM/1000977.pdf Straw belle factsheet: https://butterfly-conservation.org/sites/default/files/1.straw_belle-psf.pdf Plantlife management guide for juniper: http://www.plantlife.org.uk/download_file/force/1405/580 Rich TCG, Lambrick C & McNab C (1999) Conservation of Britain's biodiversity: *Salvia pratensis* L. (Lamiaceae), Meadow Clary, Watsonia 22: 405- 41. BSBI
Version Control Advice last updated: N/A				
Variations from national feature-framework of integrity-guidance: N/A				

Table 4: Supplementary Advice for Qualifying Features: H9130. Asperulo-Fagetum beech forests; Beech forests on neutral to rich 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**	Maintain the total extent of the feature to at least a baseline value of 973.6 hectares (but note that this is the combined total area of woodland cover including yew woodland).	There should be no measurable net reduction (excluding any trivial loss) in the extent and area of this feature. In those blocks of woodland which have been affected by planting of inappropriate species or other modification of composition this should be interpreted as meaning restoration of the woodland feature. The baseline value of extent given has been generated using data gathered from various sources and mapped as 'Priority Habitat deciduous woodland' on Webmap/MAGIC. It is subject to review and revision subject to corrections or alterations to the dataset. Note that the baseline value for extent is given as a combined total for the area of **all** woodland types as it is very difficult to accurately define and map the distinction between woodland types, and the relative extent is liable to change in any case given the dynamic nature of the woodland. It is likely that the extent of yew woodland will increase at the expense of other woodland types given the competitive advantage of yew over beech and ash. This is acknowledged as a natural trend. The extent of an Annex I habitat feature covers the sum extent of all of the component vegetation communities present and will include transitions and mosaics with other closely-associated habitat features, particularly scrub and plantation woodland. This habitat is susceptible to natural dynamic processes, such as windthrow as a result of strong winds. This should be interpreted as a natural process and a temporary, acceptable variation in extent. 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.	Groome G 2004 National Vegetation Classification Survey of Mole Gap to Reigate Escarpment cSAC Survey Area 1. Report commissioned by Natural England (Available from Natural England on request) This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Extent and distribution of the feature	**Spatial distribution of the feature**	Maintain the distribution and configuration of the feature, including where applicable its	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	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
	within the site	component vegetation types, across the site	area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. This may also reduce and break up the continuity of a habitat within a site and how well its typical species are able to move around the site to occupy and use habitat. Such fragmentation can impact on their viability and the wider ecological composition of the Annex I habitat. Smaller fragments of habitat can typically support smaller and more isolated populations which are more vulnerable to extinction. These fragments also have a greater amount of open edge habitat which will differ in the amount of light, temperature, wind, and even noise that it receives compared to its interior. These conditions may not be suitable for some of the typical and more specialist species associated with the Annex I habitat feature.	
Structure and function (including its typical species)	**Adaptation and resilience**	Maintain the H9130 feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site	See the supporting notes for this attribute above in Table1.	
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: The constant and preferential plants of the W12 woodland type	See the supporting notes for this attribute above in Table1.	
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	The regeneration potential of the woodland must be maintained into the long term if the woodland 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, re-growth from coppice stools, and where appropriate, planting. Browsing and grazing levels must permit regeneration at least	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)
		sufficient numbers in gaps, at the wood edge and/or as re-growth as appropriate ;	at sufficient level to maintain a continuity of canopy cover, i.e. browsing and grazing should not be so high and over such long periods that it is creating gaps in the canopy. Regeneration can be adversely affected by grazing/browsing by a variety of mammals such as deer, rabbits, voles and hares, and bark stripping by species such as grey squirrel.	
Structure and function (including its typical species)	**Root zones of trees**	Maintain the soil structure within and around the root zones of the mature and ancient tree cohort in an un-compacted condition	The management of land within and around woodlands can be crucial to their long-term continuity. The condition of the soil surrounding trees will affect their roots, associated mycorrhizal fungi and growth. Tree health may be affected as a result of soil compaction because chalk and/or clay particles 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 livestock and human feet may all contribute to excessive soil compaction around trees.	
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.	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.	
Structure and function (including its typical species)	**Tree and shrub species composition**	Maintain a canopy and under-storey of which 95% is composed of site native trees and shrubs Maintain a diversity (at least 3 species) of site-native trees (e.g. beech, ash, oak, cherry, rowan, yew, hazel, holly, elder) across the site.	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. In common with many woodlands on the North Downs many of the woodland blocks on this site have been modified by planting of non-native trees or through selective felling. Over time and through direct intervention it is likely that the	ENGLISH NATURE, 2003. The Implications of Climate Change for the Conservation of Beech Woodlands and Associated Flora in the UK. English Nature Research Report 528. 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)
			composition of the woodlands will change, for example though the effects of ash die-back or through establishment of yew in gaps. Wherever possible, natural processes of tree regeneration should be allowed to proceed to promote a more natural tree composition, although some limited intervention may be required to control the spread or abundance of species which may cause damaging effects.	
Structure and function (including its typical species)	**Vegetation community composition**	Ensure the component vegetation communities of the feature are referable to and characterised by the following National Vegetation Classification types: • W8 *Fraxinus excelsior – Acer campestre - Mercurialis perennis* woodland • W12 *Fagus sylvatica – Rubus fruticosus* woodland	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.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
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.	Natural' woodland structure typically has a broad range of tree age-classes which is often absent in woods which have been modified by human intervention. A natural age-class diversity will generally offer a greater variety of niches and hence support a higher biodiversity.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
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 75-90% of each woodland block.	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, soil moisture, nutrient turnover and shading; this in turn influences the composition of plants and animals in lower vegetation layers and soil. Gaps in the canopy, whether created by natural processes or the maintenance of rides and glades, is important in providing variation in light levels, temperature and habitat structure. Many scarce woodland species found at this site are dependent upon or favoured by dappled light conditions e.g. wood barley *Hordelymus europaeus,* mountain St John's wort	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)
			Hypericum montanum and coralroot bittercress *Cardamine dentaria*. Most tree species will only regenerate in gaps. However, very open conditions will tend to favour dense growth of bramble which may then shade out other plants.	
Structure and function (including its typical species)	**Vegetation structure - dead wood**	Maintain the continuity and abundance of standing or fallen dead and decaying wood, typically between 30 - 50 m3 per hectare of standing or fallen timber or 3-5 fallen trees >30cm per hectare, and >10 standing dead trees per hectare	Woodland structure includes variations in age, tree form, layering, the distribution and abundance of open space and dead wood. It plays a critical role in woodland ecosystem functioning. Dead and actively decaying wood, either as part of a standing tree or as a fallen tree on the woodland floor, is an important 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 may be very typical of the feature. As is typical of many North Downs beechwoods, the woodlands at Mole Gap to Reigate Escarpment have relatively low levels of dead and decaying wood, as beech trees have a tendency to collapse rather than remain standing as in the case of ash and oak. Nevertheless, the representation and retention of dead and decaying wood can be promoted through careful management planning, such as by reducing vulnerability to strong winds.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
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 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.	
Supporting processes (on which the feature relies)	**Air quality**	Maintain or restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System	See the supporting notes for this attribute above in Table 1.	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		(www.apis.ac.uk).		
Supporting processes (on which the feature relies)	**Conservation measures**	Maintain the management measures (either within and/or outside the site boundary as appropriate) which are necessary to restore the structure, functions and supporting processes associated with the H9130 feature	Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site. This includes 'minimum intervention' management which may be appropriate in this case. Further details about the necessary conservation measures for this site can be provided by contacting Natural England. This information will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plans and Site Management Plans.	
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.	
Version Control Advice last updated: N/A				
Variations from national feature-framework of integrity-guidance: The following attributes have been removed as they are considered not relevant for this feature on this SAC: • Open space • Wood pasture and parkland • Areas of old growth as not relevant. • Hydrology				

Table 5: Supplementary Advice for Qualifying Features: H91J0. *Taxus baccata* woods of the British Isles; Yew-dominated woodland *

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 at least a baseline value of 973.6 hectares (but note that this is the combined total area of woodland cover including beech – ash woodland).	There should be no measurable net reduction (excluding any trivial loss) in the extent and area of this feature. The baseline value of extent is considered appropriate as the long-term objective of woodland habitat conservation at this site is to maintain the existing overall extent of native woodland. The baseline value for extent is given as a combined total for the area of **all** woodland types as it is very difficult to accurately define and map the distinction between woodland types, and the relative extent is liable to change in any case given the dynamic nature of the woodland. It is likely that the extent of yew woodland will increase at the expense of other woodland types given the competitive advantage of yew over beech and ash. This is acknowledged as a natural trend. Where a reduction in the extent of a feature is considered necessary to meet the Conservation Objective for another Annex I feature (such as juniper scrub), Natural England will advise on this on a case-by-case basis. For this feature, this attribute should be taken to mean the extent of semi-natural woodland area where the tree canopy is predominantly made up by beech, ash and oak.	Groome G 2004 National Vegetation Classification Survey of Mole Gap to Reigate Escarpment cSAC Survey Area 1. Report commissioned by Natural England. This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
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	A contraction in the range, or geographic spread, of the feature (and its component vegetation and typical species, plus transitional communities) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. This may also reduce and break up the continuity of a habitat within a site and how well its typical species are able to move around the site to occupy and use habitat. Such fragmentation can impact on their viability and the wider ecological composition of the Annex I habitat. Smaller fragments of habitat can typically support smaller and more isolated populations which are more vulnerable to extinction. These fragments also have a greater amount of open edge habitat which will differ in the amount of light, temperature, wind, and even noise that it receives compared to	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			its interior. These conditions may not be suitable for some of the typical and more specialist species associated with the Annex I habitat feature.	
Structure and function (including its typical species)	**Adaptation and resilience**	Maintain the resilience of the feature by ensuring a diversity of site-native tree species; although yew may be overwhelmingly dominant.	See the supporting notes for this attribute above in Table1. The long-term response of yew to climate change is not yet clear. It is regarded as a stress-tolerant tree, capable of withstanding prolonged droughts and winter cold. However, yew is sensitive to 'cold snaps' during the spring and early summer which can result in significant die-back of mature trees and the death of young plants. It is possible that episodes of prolonged rainfall may increase the susceptibility of yew to the root disease *Phytophthora cinnamomi*. This is more prevalent in waterlogged soils and can cause die-back of trees and death of young plants. In addition, yew is sensitive to fire. So extremes of weather may influence the health and composition of yew woodlands.	Thomas PA & Polwart A (2003) Biological Flora of the British Isles – *Taxus baccata* L. Journal of Ecology 91 489-524.
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 feature	Invasive or introduced non-native species are a serious potential threat to the biodiversity of native and ancient woods, because they are able to exclude, damage or suppress the growth of native tree, shrub and ground species (and their associated typical species), reduce structural diversity and prevent the natural regeneration of characteristic site-native species. Once established, the measures to control such species may also impact negatively on the features of interest (e.g. use of broad spectrum pesticides). Such species would include cherry laurel, boxleaf honeysuckle and sycamore, for example. Similarly, this would include pheasants, rabbits and non-native invertebrate 'pest' species.	
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	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, re-growth from coppice stools or pollards, and where appropriate planting. Yew does not generally regenerate from seedlings under an established canopy and is essentially a colonist of open ground. However,	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		sufficient numbers in gaps, at the wood edge and/or as re-growth as appropriate.	it will also establish in gaps in other woodland types. Browsing and grazing levels must not be at levels which prevent the survival of sufficient numbers of yew trees and associated trees and shrubs to maintain the feature.	
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.	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.	
Structure and function (including its typical species)	**Tree and shrub species composition**	Maintain a canopy and under-storey of which 95% is composed of site native trees and shrubs, such as yew, whitebeam, box, beech, ash and hawthorn.	Native trees and shrubs in general support a greater diversity of associated species than non-native species, especially amongst groups of invertebrates which depend directly on trees for food and shelter. There are many plants and animals which use or co-exist with non-native trees, but many rare and threatened woodland species are specialists adapted to one or a few native trees or shrub species.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
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: • Constant and preferential plant species of the W13 *Taxus baccata* woodland NVC vegetation types at this SAC	Some plant or animal species (or related groups of such species) make a particularly important contribution to the necessary structure, function and/or quality of an Annex I habitat feature at a particular site. These species will include; • Structural species which form a key part of the Annex I habitat's structure or help to define that habitat on a particular SAC (see also the attribute for 'vegetation community composition'). • Influential species which are likely to have a key role affecting the structure and function of the habitat (such as bioturbators (mixers of soil/sediment), grazers, surface borers, predators or other species with a significant functional role linked to the habitat) • Site-distinctive species which are considered to be a particularly special and distinguishing component of an Annex I habitat on a particular SAC.	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			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.	
Structure and function (including its typical species)	**Vegetation community composition**	Ensure the component vegetation communities of the feature are referable to and characterised by the following National Vegetation Classification type: W13 *Taxus baccata*	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. This will also help to conserve their typical plant species (i.e. the constant and preferential species of a community), and therefore that of the SAC feature, at appropriate levels (recognising natural fluctuations).	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	**Vegetation structure - age class distribution**	Maintain at least 2 age classes (e.g. sapling stage, mature, veteran) spread across the average life expectancy of the trees - which in the case of yew can be hundreds of years.	A distribution of size and age classes of the major site-native tree and shrub species is desirable in providing structural variation and will generally indicate that the woodland will continue in perpetuity. However, it is accepted that yew woodlands generally take the form of single-aged stands as they tend to originate from colonisation of chalk grassland, essentially forming a late seral stage of succession.	Thomas PA & Polwart A (2003) Biological Flora of the British Isles – *Taxus baccata* L. Journal of Ecology 91 489-524. This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
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 75-90% of each stand	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	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)
			and soil. Open canopies with just scattered trees will have less of a woodland character and reduced diversity of woodland-dependent species. 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. In general, the woodland canopy of this feature should provide a core of woodland interior conditions with some open and edge habitat as well. Typically however, yew woodlands often have even-aged, closed canopies with small amounts of open space associated with features such as steep slopes and access routes.	
Structure and function (including its typical species)	**Vegetation structure - dead wood**	Maintain the continuity and abundance of standing or fallen dead and decaying wood, typically between 30 - 50 m3 per hectare of standing or fallen timber or 3-5 fallen trees >30cm per hectare	In yew woodland the quantity of standing dead and decaying wood is often very small due to the longevity of yew trees and resilience of the timber to decay. However, yew can be an important tree for specialised invertebrates associated with features such as natural pools of water in the junction of boughs, accumulations of slowly decaying humus in crevices, and internal hollows. Dead and actively decaying wood, either as part of a standing tree or as a fallen tree on the woodland floor, can be important in supporting specific fungi, lichens and bryophytes. Older yew trees often develop internal hollows in the trunk and can be important as roost sites for bats.	Thomas PA & Polwart A (2003) Biological Flora of the British Isles – *Taxus baccata* L. Journal of Ecology 91 489-524. This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
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 50% of the feature at any one time) and the assemblages of veteran and ancient trees.	A characteristic feature of some stands of the yew woodland habitat feature in southern England is the extreme longevity of the yew trees. This gives rise to a high degree of variation in tree form, in turn providing a wide variety of habitat niches for invertebrates, bats and nesting birds. The retention of old-growth stands with minimal management intervention is a particular priority with this woodland type.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its	**Vegetation structure - open space**	Maintain areas of permanent/ temporary open space within the woodland feature, typically to	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	This attribute will be periodically monitored as part of Natural England's SSSI Condition

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
typical species)		cover approximately 5% of area each stand	functioning. Having some open, sunlit and largely tree-less areas as part of the woodland community is often important to facilitate natural tree and shrub regeneration and also to provide supporting habitat for specialist woodland invertebrates, birds, vascular and lower plants. Such open space can be permanent or temporary and may consist of managed grazed areas, linear rides and glades, or naturally-produced gaps caused by disturbance events such as windthrow/fire/tree falling over/snow damage. This target is less important here than would be the case with many woodland sites because the stands of the yew woodland feature are mostly set in a context of a complex mosaic including transitions and open grassland.	Assessments
Structure and function (including its typical species)	**Vegetation structure - shrub layer**	Maintain a sparse understorey of bushes or young trees of characteristic species e.g. holly, hawthorn, elder and box.	Yew woodland typically has a very sparse (or no) understorey because of the very dense canopy conditions and heavy shade cast by trees. The objective is to seek to ensure that natural processes of tree and shrub reproduction are able to proceed and that management or adverse impacts are not affecting the development of a natural understorey, even though that may be very sparse.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
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.	
Supporting processes (on which the feature relies)	**Air quality**	Maintain or restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System	See the supporting notes for this attribute above in Table 1.	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		(www.apis.ac.uk).		
Supporting processes (on which the feature relies)	**Functional connectivity with wider landscape**	Maintain or restore where necessary 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, watercourses and verges, outside of the designated site boundary which are either important for the migration, dispersal and genetic exchange of those typical species closely associated with qualifying Annex I habitat features of the site. These features may also be important to the operation of the supporting ecological processes on which the designated site and its features may rely. In most cases increasing actual and functional landscape-scale connectivity would be beneficial. Where there is a lack of detailed knowledge of the connectivity requirements of the qualifying feature, Natural England will advise as to whether these are applicable on a case by case basis.	
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.	
Version Control Advice last updated: N/A				
Variations from national feature-framework of integrity-guidance: Removed attribute relating to hydrology as considered not relevant for this feature on this SAC				

Table 6: Supplementary Advice for Qualifying Features: S1166. *Triturus cristatus*; Great crested newt

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Population (of the feature)	**Population abundance**	Maintain the abundance of the population at a level which is at or above the typical carrying capacity of the site.	The size of great crested newt populations often vary between years as the recruitment of new generations is affected by factors such as pond dessication and habitat suitability. The objective is to seek to ensure that the site continues to support a viable population of a size which would be reasonably expected to occur at this site assuming that good habitat suitability is maintained. It is not currently possible to define a specific population size target at this site due to a lack of data but this aspect may be reviewed if better information becomes available. Given the likely fluctuations in numbers over time, any impact-assessments should focus on the current size of the site's population, as derived from the latest known or estimated level established using the best available data. This advice accords with the obligation to avoid deterioration of the site or significant disturbance of the species for which the site is designated, and seeks to avoid plans or projects that may affect the site giving rise to the risk of deterioration. Population size or presence should be measured using standard methods, such as peak mean counts or breeding surveys. Estimating the average size of the population will normally be based on the peak count of adults undertaken in the known peak season for the area, and in-year weather conditions. The peak count is derived by summing the counts across the site on 'best' night for each season.	
Population (of the feature)	**Population viability**	Maintain the presence of great crested newt eggs in breeding ponds at/to a level which is likely to maintain the abundance of the population at or above its target level.	A "breeding pond" is defined as a pond in which egg-laying and successful metamorphosis (e.g. the pond doesn't dry up too soon) is likely to occur at least once every three years.	
Population (of the feature)	**Supporting meta-populations**	Maintain or restore as necessary the connectivity of the SAC population to any associated meta-populations (either within or	Great crested newts often exist in 'meta-populations'. A meta-population is a group of associated populations made up of newts which breed in, and live around, a cluster of ponds. There will be some interchange of newts between these	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		outside of the site boundary)	populations, even though most adults consistently return to the same pond to breed, and so it will be important to avoid the isolation of these populations from each other. A meta-population associated with a SAC may occur outside of the designated site boundary. The connectivity of the wider local landscape to the SAC may therefore be important in helping to ensure the survival of the overall population even if sub-populations are temporarily affected by, for example, pond desiccation or fish introductions.	
Supporting habitat: extent and distribution	**Distribution of supporting habitat**	Maintain or restore as necessary the distribution and continuity of the feature and its supporting habitat, including where applicable its component vegetation types and associated transitional vegetation types, across the site	A contraction in the range, or geographic spread, of the feature and its supporting habitat across the site will reduce its resilience to adapt to environmental changes. Habitat fragmentation will tend to reduce the ability for animals to move across the landscape and reduce opportunities for meta-populations to interact, resulting in a risk of genetic isolation of populations. The extent and distribution of supporting habitat for great crested newt at Headley Heath and its connectivity with the surrounding landscape is not well understood. Headley Heath has undergone significant changes since the 1940s, with a long period of management neglect which resulted in expansion of tree and bracken cover, followed in more recent times by extensive habitat restoration. The objective is to seek to ensure that suitable terrestrial habitat conditions are maintained in the vicinity of known breeding ponds and that good connectivity is maintained to habitat patches nearby which have the potential to provide feeding habitat, hibernation sites, and cover and protection from predators. The retention of features such as shady, humid woodland, damp grassland, log piles, bramble patches, damp hollows and ephemeral pools will be particularly valuable. There are several ponds in Headley village and the surrounding area which are off site but within the potential dispersal range of great crested newts. It is possible that these play an important role in supporting the local meta-population. These should be retained and care taken to avoid the creation of new	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			barriers to newt movement between them and the wider landscape. The provision of habitat linkage routes across the landscape suitable for great crested newts to disperse, find favoured feeding areas and interact with individuals from other meta-populations is important. Great crested newts show a preference when moving across the landscape for features such as hedgerows, damp ditches and low-lying areas, woodlands, waste ground and areas of damp grassland. They will generally avoid heavily grazed pastures, arable fields and mown grassland.	
Supporting habitat: extent and distribution	**Extent of supporting habitat**	Maintain or restore as necessary the total extent of the habitat(s) which support the feature.	It is acknowledged that it is difficult to define an appropriate extent of supporting habitat for great crested newt meta-populations. Newt population densities have been found to vary widely in response to a range of factors including the condition and suitability of breeding ponds, habitat diversity, land use, habitat management, availability of hibernacula, recreational disturbance, level of predation, etc. However, a guiding principle should be to seek to ensure that there is no reduction in the overall extent of breeding pond and terrestrial habitat in the core area supporting the local meta-population. It will be important that this is taken into account when planning management of both the core area thought to be utilised by the meta-population and areas immediately adjacent which may be of critical value for the survival of the meta-population. The information available on the baseline extent and distribution of supporting habitat used by the feature may be better defined in future in the light of new information.	Mole Valley Natural History Audit – Amphibians, Reptiles and Wetlands. Mole Valley Agenda 21 – Nature Conservation sub-group (provides information on the location of ponds at Headley Heath and presence of amphibians). This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Supporting habitat: structure/ function	**Cover of macrophytes**	Maintain or restore where necessary a high cover of macrophytes, typically between 50-80%, in ponds	Great crested newts lay their eggs on submerged water plants, showing a preference for plants with curled leaves which offer a degree of protection from predation, such as pondweed *Elodea* spp., flote grass *Glyceria fluitans*, brooklime *Veronica beccabunga* and water forget-me-not *Myosotis scorpioides*. The presence of other submerged and floating plants can be important in providing cover and protection from predation.	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)
			Ideally, ponds should have a balance between submerged, emergent, floating and marginal plants, as ponds with a diversity of aquatic vegetation types and structures will generally support a higher biodiversity. However, great crested newts are adapted to utilise ponds which may in some years dry out completely and this will affect the composition of the aquatic plant community. So important 'breeding ponds' often appear to be sub-optimal. Where the marginal vegetation is particularly invasive, and provides no specific benefit to crested newts, it may be appropriate to remove or reduce it. In ponds where conditions are unsuitable for the growth of submerged water plants but habitat conditions are otherwise good for great crested newts they may utilise submerged fallen leaves for egg-laying.	
Supporting habitat: structure/ function	**Overall Habitat Suitability Index score**	Maintain an overall Great Crested Newt Habitat Suitability Index score of no less than 0.8.	The Habitat Suitability Index provides a measure of evaluating habitat quality and quantity for great crested newt. The Index score lies between 0 and 1, with 1 representing optimal great crested newt habitat. In general, the higher the index score the more likely the site is to support great crested newts. The Habitat Suitability Index methodology is documented in ARG-UK Advice Note 5. The methodology should not be used as a substitute for more detailed surveys and consideration of other attributes where necessary.	Great Crested Newt Habitat Suitability Index ARG-UK Advice Note 5 (May 2010)
Supporting habitat: structure/ function	**Permanence of ponds**	Maintain the natural water regime of ponds	Newts will utilise ponds of different size, water depth and permanance at different times and different life stages. To be of greatest value as breeding ponds there should be a high degree of permanence, i.e. should only dry out in exceptionally dry years. Occasional drying out of breeding ponds can play an important role in reducing the suitability of ponds for species which compete with or prey on great crested newts, such as fish, and other amphibians.	
Supporting habitat: structure/ function	**Presence of fish**	Ensure fish are absent in all breeding ponds.	Fish can be significant predators of newt larvae and many species reduce the suitability of ponds for newts and other amphibians by increasing turbidity through disturbance of bottom sediments.	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Supporting habitat: structure/ function	**Presence of ponds**	Maintain or restore where necessary the number of ponds present within the site.	This refers to all ponds in the core area of the site thought to be critical in supporting the full range of life stages of the local great crested newt population, so will include breeding ponds as well as non-breeding ponds and ephemeral ponds.	Mole Valley Natural History Audit – Amphibians, Reptiles and Wetlands. Mole Valley Agenda 21 – Nature Conservation sub-group (provides information on the location of ponds at Headley Heath and presence of amphibians).
Supporting habitat: structure/ function	**Shading of ponds**	Ensure pond margins are generally free of shade (typically no more than 60% cover of the shoreline)	Although great crested newts have a strong association with woodlands as well as more open habitats shading from trees and shrubs can negatively affect the suitability of ponds to support the species. Heavy shading will tend to reduce the cover of submerged and marginal vegetation, water temperature and the rate of hatching and development of great crested newt eggs and larvae. Ideally, ponds should receive light for a significant proportion of the day through most of the year, especially during the tadpole stage.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Supporting habitat: structure/ function	**Soils, substrate and nutrient cycling**	Maintain the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungal: bacterial ratio, within typical values for the supporting habitat	Soil supports basic ecosystem function and is 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 the supporting habitat of this Annex II feature.	
Supporting habitat: structure/ function	**Supporting terrestrial habitat**	Maintain or restore where necessary the quality of terrestrial habitat likely to be utilised by Great Crested Newts, with no fragmentation of habitat by significant barriers to newt dispersal.	Great crested newts need both aquatic and terrestrial habitat. Good quality terrestrial habitat, particularly within 500m of the breeding ponds, provides important sheltering, dispersing and foraging conditions. A wide range of semi-natural habitats are utilised by newts including meadows, tussocky grassland, scrub, woodland, as well as 'brownfield' land or low-intensity farmland. Good quality terrestrial habitat for great crested newt has structural diversity which can be provided by features such as hedges, ditches, stone walls, old farm buildings, loose stone/rocks, rabbit burrows and small mammal holes. Good quality habitat is that which will provide a variety of food	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			sources for newts, such as earthworms, insects, spiders and slugs, as well as cover and protection from predation. Habitat fragmentation refers to significant barriers to newt movement such as walls and buildings, but not footpaths or tracks which newts can usually cross. Newts disperse over land to forage for food, and move between ponds, sometimes over a considerable distance. The distances moved during dispersal vary widely according to habitat quality and availability. At most sites, the majority of adults probably stay within around 250m of the breeding ponds but may well travel further if there are areas of high quality foraging and refuge habitat extending beyond this range.	
Supporting processes (on which the feature and/or its supporting habitat relies)	**Adaptation and resilience**	Maintain or restore as necessary the feature's ability, and that of its supporting habitat, to adapt or evolve to wider environmental change, either within or external to the site	See the supporting notes for this attribute above in Table1. In the case of the great crested newt the potential impacts of climate change are not well understood but as breeding behaviour, egg-laying and tadpole development are all heavily influenced by temperature there may be effects on reproduction and breeding success. It is also likely that increasing extremes of weather will affect habitat suitability for newts. In particular, frequent drying out of ponds in spring before tadpoles have completed their metamorphosis to the adult stage has the potential to have serious consequences for newt populations. Resilience will be improved through the provision of good quality supporting habitat which provides a diversity of structure and habitat type, and the availability of ponds with a range of water depth within the dispersal area of the newt population, including ponds which are off-site.	
Supporting processes (on which the feature and/or its supporting habitat relies)	**Air quality**	Maintain or, where necessary, restore concentrations and deposition of 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).	See the supporting notes for this attribute above in Table 1.	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Supporting processes (on which the feature and/or its supporting habitat relies)	**Conservation measures**	Maintain or restore as necessary the management measures (either within and/or outside the site boundary as appropriate) which are necessary to maintain the structure, functions and supporting processes associated with the feature and/or its supporting habitats.	Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site. Further details about the necessary conservation measures for this site can be provided by contacting Natural England. This information will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, site management strategies or plans, the Views about Management Statement for the underpinning SSSI and/or management agreements.	Baker J Beebee T Buckley J Gent T & Orchard D 2011 Amphibian Habitat Management Handbook. Amphibian and Reptile Conservation, Bournemouth.
Supporting processes (on which the feature and/or its supporting habitat relies)	**Water quantity/ quality**	Where the feature or its supporting habitat is dependent on surface water and/or groundwater maintain water quality and quantity to a standard which provides the necessary conditions to support the feature.	Great crested newt populations are critically dependent on the quality and quantity of water supply to their supporting wetland habitats. Poor water quality and inadequate quantities of water can adversely affect the structure and function of ponds and their suitability for great crested newt. Described in simple terms ponds will be more suitable for great crested newt where they have high water clarity, low or very low nutrient status, and high levels of dissolved oxygen. The water regime should be as near natural condition as possible, i.e. supplied by rainfall and surface flow/groundwater seepage. Great crested newts are dependent upon the maintenance of water chemistry within a specific pH range, i.e. neither strongly alkaline nor moderately or strongly acidic. Given that the ponds at Headley Heath are largely fed by rainfall and surface flow it will be important to consider potential impacts on breeding ponds when planning management in their vicinity which may influence soil chemistry (and hence water chemistry).	
Supporting processes (on which the feature or its supporting habitat relies)	**Water quality**	Maintain high water quality in all ponds in the core area supporting the meta-population.	Great crested newts will often utilise a network of ponds, ditches and wet hollows, in addition to core 'breeding ponds'. It may be of critical importance that this network is maintained in good condition to support the local newt population. Water quality will be affected by factors such as nutrient input, turbidity and surrounding land use. As the clarity and chemical status of water bodies supporting	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			great crested newt can be subjective, the presence of an abundant and diverse community of freshwater invertebrates can be useful as a proxy indication of suitable water quality. Invertebrate groups present which will indicate high suitability for newts will include mayfly larvae and water shrimps. This will ensure ponds support a healthy ecosystem which provides food for developing newt larvae and adults.	
Version Control Advice last updated: N/A				
Variations from national feature-framework of integrity-guidance: N/A				

Table 7: Supplementary Advice for Qualifying Features: S1323. *Myotis bechsteinii* Bechstein`s bat

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Population (of the feature)	**Population abundance**	Maintain the abundance of the breeding population at a level which is above the baseline population-size known or estimated at or soon after the time of SAC designation, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent. Due to the difficulties in monitoring this species and the low numbers thought to be present a pragmatic target can be adopted in this case, that is to ensure that a viable population of the species is maintained at this site.	The setting of a specific target for this aspect is problematic due to the difficulty in monitoring this species and the possibility that the population may be more widespread on the site than currently assumed (it is known at 2 hibernation sites in disused lime kilns and 2 other possible locations but may be more widely distributed across the site). The location of maternity sites has not yet been determined. Advances in survey technology such as the use of DNA sampling, combined with emergence counts, may provide better information in the future. Maintenance of the population will ensure that the feature is being maintained at a level that contributes to its Favourable Conservation Status across its natural range in the UK. Due to the dynamic nature of population change, the target-value given for the population size or presence of this feature is considered to be the minimum standard for conservation/ restoration measures to achieve. This minimum value may be revised where there is evidence to show that a population's size or presence has significantly changed as a result of natural factors or management measures and has been stable at or above a new level over a considerable period (generally at least 10 years). The values given here may also be updated in future to reflect any strategic objectives which may be set at a national level for this feature. Bat populations are regularly monitored in the two known hibernation sites by the Surrey Bat Group. However, surveying for this species in underground sites is highly challenging and thought to often result in under-estimation of numbers, as individual Bechstein's bats may be located in crevices in inaccessible parts of the cave/chamber. Given the likely fluctuations in numbers over time, any impact-assessments should focus on the current size of the site's population, as derived from the latest known or estimated level	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			established using the best available data. This advice accords with the obligation to avoid deterioration of the site or significant disturbance of the species for which the site is designated, and seeks to avoid plans or projects that may affect the site giving rise to the risk of deterioration. Similarly, where there is evidence to show that a feature has historically been more abundant than the stated minimum target and its current level, the ongoing capacity of the site to accommodate the feature at such higher levels in future should also be taken into account in any assessment. Unless otherwise stated, the population size or presence will be that measured using standard methods, such as peak mean counts or breeding surveys. This value is also provided recognising there will be inherent variability as a result of natural fluctuations and margins of error during data collection. Whilst we will endeavour to keep these values as up to date as possible, local Natural England staff can advise that the figures stated are the best available.	
Supporting habitat: extent and distribution	**Distribution of supporting habitat**	Maintain the distribution and continuity of the feature and its supporting habitat, including where applicable its component vegetation types and associated transitional vegetation types, across the site	A contraction in the range, or geographic spread, of the feature (and its component vegetation) 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. Contraction may also reduce and break up the continuity of a habitat within a site and how well the species feature is able to occupy and use habitat within the site. Such fragmentation may 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 this feature and this may affect its viability.	
Supporting habitat: extent and distribution	**Extent of supporting habitat**	Maintain the total extent of the habitat(s) which support the feature at the baseline level of 25 hectares.	In order to contribute towards the objective of achieving an overall favourable conservation status of the feature at a UK level, it is important to maintain or if appropriate restore the extent of supporting habitats and their range within this SAC. The setting of a clearly defined target for this aspect is problematic as the size of territory required to sustain a local	Greenaway F & Hill D 2004 Woodland management advice for Bechstein's bat and barbastelle bat. English Nature Research Report 658. Smith D The Bechstein's Bat

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			population of Bechstein's bat will depend on a large number of factors and will vary from year to year according to weather conditions, prey availability, population size, etc. As a precautionary approach, a baseline target of maintenance of at least 25 hectares of broadleaved woodland in suitable condition to provide good quality feeding habitat around the known hibernation sites is proposed. This is based upon common assumptions of territory size of Bechstein's bat populations in the UK. This may be refined if better quality information is obtained.	Survey. Surrey Bat Group.
Supporting habitat: structure/ function	**Commuting routes from roost into surrounding habitat and foraging areas**	Maintain the presence, structure and quality of any linear landscape features which function as habitually used routes along which bats navigate to foraging and swarming areas. Routes should remain unlit, functioning as dark corridors.	The ecology of Bechstein's bat is poorly known because of its rarity and difficulties in monitoring and surveying for this species. However, some assumptions can be made about the foraging behaviour of this species at the site. The habitats present are generally not typical of the 'natural' favoured supporting habitat of long-established broadleaved woodland dominated by oak. Therefore, bats may travel some distance, including off-site, to reach favoured foraging areas. Surveys in the vicinity of the known hibernation sites may indicate that Bechstein's bats utilise hedgerows and other linear habitats, such as the River Mole and riparian woodlands to range quite widely for foraging and other aspects of behaviour. Although Bechstein's are strongly associated with broadleaved woodlands they may also utilise individual trees in hedgerows, on river banks or in parkland for roosting, especially where these have connections to the main woodland habitat. Bechstein's bat is thought to mostly forage within deciduous woodland but this species will also commute along linear landscape features such as woodland edge and hedgerows, and they will cross open fields to reach roost sites and foraging areas.	
Supporting habitat: structure/ function	**External condition of hibernation site**	Maintain the structural integrity and weatherproofing of the known hibernation sites, with no significant shading of the main	Damp, draught and increases in light levels are likely to have a negative effect on the temperature and humidity of roost sites. In this case known hibernation sites which are associated with former mines and built structures have been protected by	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		roost area by trees/vegetation or man-made structures.	installing grilles and/or roofs, which should be retained in position and maintained.	
Supporting habitat: structure/ function	**Internal condition of hibernation roost sites**	Maintain appropriate light levels, humidity, temperature and ventilation in the known hibernation roost sites	The requirements of Bechstein's bats vary throughout the period of pregnancy to giving birth and they will shift their roost sites accordingly. There is currently insufficient information available in the academic press to provide specific targets on humidity, temperature, light levels and ventilation preferred by the species but a precautionary approach should be adopted whereby conditions should be maintained in as near a natural state as possible..	
Supporting habitat: structure/ function	**Roost access**	Maintain the number of access points to the roost at an optimal size and in an unlit and unobstructed state, with surrounding vegetation providing sheltered flyways without obstructing access	This refers to the known hibernation roost sites. The maintenance of access and prevention of blockage by vegetation growth or other factors will be critical in maintaining the population and will reduce the risk of negative internal climatic changes within the roost.	
Supporting habitat: structure/ function	**Soils, substrate and nutrient cycling**	Maintain the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungal: bacterial ratio, within typical values for the supporting habitat	Soil supports basic ecosystem function and is 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 the supporting habitat of this Annex II feature.	
Supporting processes (on which the feature and/or its supporting habitat relies)	**Adaptation and resilience**	Maintain the feature's ability, and that of its supporting habitat, to adapt or evolve to wider environmental change, either within or external to the site	See the supporting notes for this attribute above in Table1.	Newman C & Macdonald DW 2015 Biodiversity Climate change impacts report card Technical paper 2. The Implications of climate change for terrestrial UK Mammals. NERC.
Supporting processes (on which the feature and/or its supporting habitat relies)	**Air quality**	Maintain or, where necessary, restore concentrations and deposition of 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	See the supporting notes for this attribute above in Table 1.	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		(www.apis.ac.uk).		
Supporting processes (on which the feature and/or its supporting habitat relies)	**Conservation measures**	Maintain the management measures (either within and/or outside the site boundary as appropriate) which are necessary to maintain the structure, functions and supporting processes associated with the feature and/or its supporting habitats.	Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site (which may include minimum intervention). Further details about the necessary conservation measures for this site can be provided by contacting Natural England. This information will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, site management strategies or plans, the Views about Management Statement for the underpinning SSSI and/or management agreements. In the case of Bechstein's bat the critical factor for the conservation of populations is the planning of woodland management and the management of linear features in the wider landscape. This species is strongly associated with ancient woodland with a natural composition and structure, including the availability of features such as large diameter standing dead wood. The species shows a strong preference for woodlands with a dense understorey with low levels of human disturbance and low levels of management intervention. However, they will often range widely across the landscape along habitually used routes making use of linear features for navigation. The removal of hedgerows and mature trees, or new development (including new lighting) can have profound effects on the suitability of the landscape for this species.	Bat Conservation Trust species information sheet Bechstein's bat.
Supporting processes (on which the feature and/or its supporting habitat relies)	**Disturbance from human activity**	Control and minimise human access to roost sites	This refers to the known hibernation roost sites in disused lime kilns and caverns at the site. These should be maintained in a secure condition to prevent unauthorised access, which can result in disturbance to bats at critical times of year and which can affect their population viability and use of the site. Grilles or other protective barriers at access points should be maintained where present.	
Version Control: Advice last updated: N/A				
Variations from national feature-framework of integrity-guidance: Removed attribute relating to **integrity of maternity roost building** and **Water Quality** as not relevant to this feature within this SAC.				