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

Mendip Limestone Grasslands Special Area of Conservation (SAC)
Site Code: UK0030203

Uphill Cliff SSSI – Chris Westcott Natural England

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About this document

This document provides Natural England's supplementary advice about the European Site Conservation Objectives relating to Mendip Limestone Grasslands SAC.

This advice should therefore be read together with the SAC Conservation Objectives available here.

Where this site overlaps with other European Site(s), you should also refer to the separate European Site Conservation Objectives and Supplementary Advice (where available) provided for those sites.

This advice replaces a draft version dated 21 January 2019 following the receipt of comments from the site's stakeholders.

You should use the Conservation Objectives, this Supplementary Advice and any case-specific advice given by Natural England when developing, proposing or assessing an activity, plan or project that may affect this site'

This Supplementary Advice to the Conservation Objectives presents attributes which are ecological characteristics of the designated species and habitats within a site. The listed attributes are considered to be those that best describe the site's ecological integrity and which, if safeguarded, will enable achievement of the Conservation Objectives. Each attribute has a target which is either quantified or qualitative depending on the available evidence. The target identifies as far as possible the desired state to be achieved for the attribute.

The tables provided below bring together the findings of the best available scientific evidence relating to the site's qualifying features, which may be updated or supplemented in further publications from Natural England and other sources. The local evidence used in preparing this supplementary advice has been cited. The references to the national evidence used are available on request. Where evidence and references have not been indicated, Natural England has applied ecological knowledge and expert judgement. You may decide to use other additional sources of information.

In many cases, the attribute targets shown in the tables indicate whether the current objective is to 'maintain' or 'restore' the attribute. This is based on the best available information, including that gathered during monitoring of the feature's current condition. As new information on feature condition becomes available, this will be added so that the advice remains up to date.

The targets given for each attribute do not represent thresholds to assess the significance of any given impact in Habitats Regulations Assessments. You will need to assess this on a case-by-case basis using the most current information available.

Some, but not all, of these attributes can also be used for regular monitoring of the actual condition of the designated features. The attributes selected for monitoring the features, and the standards used to assess their condition, are listed in separate monitoring documents, which will be available from Natural England.

These tables do not give advice about SSSI features or other legally protected species which may also be present within the European Site.

If you have any comments or queries about this Supplementary Advice document please contact your local Natural England adviser or email HDIRConservationObjectivesNE@naturalengland.org.uk

About this site

European Site information

Name of European Site	Mendip Limestone Grasslands Special Area of Conservation (SAC)
Location	Somerset
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	415.24ha
Designation Changes	None
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)	Brean Down SSSI, Crook Peak to Shute Shelve Hill SSSI, Uphill Cliff SSSI
Relationship with other European or International Site designations	Adjacent and slightly overlapping with Severn Estuary SAC and SPA and RAMSAR Greater and Lesser Horseshoe bats from North Somerset and Mendip Bats SAC forage and roost over this Mendip limestone grasslands SAC.

Site background and geography

The Mendip Limestone Grasslands SAC is comprised of three areas: Brean Down, Uphill Cliff, and Crook Peak to Shute Shelve Hill. Brean Down and Uphill Cliff are coastal and lie within the Somerset Levels & Moors National Character Area (NCA Profile 142) while Crook Peak to Shute Shelve Hill extends to some 15km inland within the Mendip Hills National Character Area (NCA Profile 141).

The sites are located on the Carboniferous Limestone ridge which forms much of the Mendip Hills. The SAC supports the largest area of CG1 *Festuca ovina - Carlina vulgaris* grassland in the British Isles. Also present is CG2 *Festuca ovina - Avenula pratensis* grassland which often occurs as a mosaic with the CG1. The site is exceptional in that it supports a number of rare and scarce vascular plants typical of the oceanic southern temperate and Mediterranean elements of the British flora. These include white rock-rose *Helianthemum appeninum*, Somerset hair-grass *Koeleria vallesiana* and honewort *Trinia glauca*. Transitions to limestone heath occur on Crook Peak to Shute Shelve Hill. Also present are caves and Tilio-acerion woodland, the caves being hibernacula for Greater horseshoe bat *Rhinolophus ferrumequinum*.

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:

- **H8310 Caves not open to the public**

Caves are formed by the erosion of soluble rocks, such as limestones. They typically form the subterranean components of a distinctive 'karst' landscape, and are associated with various topographic features, including gorges, dry valleys, 8240 Limestone pavements, and dolines (surface depressions and hollows). Caves not open to the public is interpreted as referring to natural caves which are not routinely exploited for tourism, and which host specialist or endemic cave species or support important populations of Annex II species.

- **H4030 European dry heaths**

European dry heaths typically occur on freely-draining, acidic to circumneutral soils with generally low nutrient content. Ericaceous dwarf-shrubs dominate the vegetation. The most common is heather *Calluna vulgaris*, which often occurs in combination with gorse *Ulex* spp., bilberry *Vaccinium* spp. or bell heather *Erica cinerea*, though other dwarf-shrubs are important locally. Nearly all dry heath is semi-natural, being derived from woodland through a long history of grazing and burning. Most dry heaths are managed as extensive grazing for livestock or, in upland areas, as grouse moors.

- **H6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)**

This site comprises coastal and inland sections of the Carboniferous Limestone outcrops of the Mendips. The coastal headland and inland hills support the largest area of CG1 *Festuca ovina – Carlina vulgaris* grassland in England, including two sub-types (CG1a *Carex humilis* and CG1c *Trinia glauca* sub-communities) known from no other site in the UK. Areas of short-turf CG2 *Festuca ovina – Avenula pratensis* grassland also occur inland. The site is exceptional in that it supports a number of rare and scarce vascular plants typical of the oceanic southern temperate and Mediterranean elements of the British flora. These include white rock-rose *Helianthemum apenninum*, Somerset hair-grass *Koeleria vallesiana* and honewort *Trinia glauca*. Transitions to limestone heath (4030 European dry heaths) situated on flatter terrain also occur.

- **H9180 Tilio-Acerion forests of slopes, screes and ravines * Priority feature**

Tilio-Acerion ravine forests are woods of ash *Fraxinus excelsior*, wych elm *Ulmus glabra* and lime (mainly small-leaved lime *Tilia cordata* but more rarely large-leaved lime *T. platyphyllos*). Introduced sycamore *Acer pseudoplatanus* is often present and is a common part of the community in mainland Europe, where it is native. The habitat type typically occurs on nutrient-rich soils that often accumulate in the shady micro-climates towards the bases of slopes and ravines. Therefore it is found on calcareous substrates associated with coarse scree, cliffs, steep rocky slopes and ravines, where inaccessibility has reduced human impact. It often occurs as a series of scattered patches grading into other types of woodland on level valley floors and on slopes above, or as narrow strips along stream-sides. More extensive stands occur on limestone and other base-rich rocks.

Qualifying Species:

- **S1304 Greater horseshoe bat *Rhinolophus ferrumequinum***

The greater horseshoe bat *Rhinolophus ferrumequinum* is one of the largest bats in the UK. During the summer, they form maternity colonies, generally in large old buildings, and forage in pasture, edges of mixed deciduous woodland and hedgerows. Such mixed land-use, especially on south-facing slopes,

favours the beetles, moths and other insects on which the bats feed. In winter they depend on caves, abandoned mines and other underground sites for undisturbed hibernation. A system or series of sites is required, offering a range of temperatures and air-flow patterns. Summer and winter roosts are usually less than 20-30 km apart. The bats are vulnerable to the loss of insect food supplies due to insecticide use, changing farming practices and the loss of broad-leaved tree-cover, and to the loss or disturbance of underground roost sites.

This site is considered to support a significant presence of greater horseshoe.

The greater horseshoe bat 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 2017, making it a ‘European Protected Species’. A Licence may therefore be required for any activities likely to harm or disturb greater horseshoe bat.

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 OR if necessary restore the total extent of the feature to 84.71 hectares	There should be no measurable reduction (excluding any trivial loss) in the extent and area of this feature, and in some cases, the full extent of the feature may need to be restored. The baseline-value of extent given has been generated using data gathered from the listed site-based surveys. Area measurements given may be approximate depending on the methods, age and accuracy of data collection, and as a result this value may be updated in future to reflect more accurate information. The extent of an Annex I habitat feature covers the sum extent of all of the component vegetation communities present and may include transitions and mosaics with other closely-associated habitat features. Where a feature is susceptible to natural dynamic processes, there may be acceptable variations in its extent through natural fluctuations. 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 habitat is only found within the Crook Peak to Shute Shelve Hill SSSI. It should be noted that the figure for extent of H4030 has been taken from the SAC Standard Data Form but is thought to be more in the region of 30ha (Bob Corns pers. comm. 2018). This corresponds to the Definition of Favourable Condition document. Further investigation and survey is needed to establish a more accurate figure.	Natural England (Various) Definitions of Favourable Condition for component SSSIs within Mendip Limestone SAC Natural England (2014) Mendip Limestone Grassland Site Improvement Plan provides useful details:- National Trust (1987) Crook Peak NVC survey Additional up-to-date survey details can be found within the University of Bristol - Change in Protected Grassland Habitats within the Mendip SSSI Network 1999-2018: Application of Photographic and Ancillary Data for Monitoring 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 OR if necessary restore 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	Reference material as above.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			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)	**Vegetation community composition**	Ensure the component vegetation communities of the feature are referable to and characterised by the following National Vegetation Classification type H8 *Calluna vulgaris-Ulex gallii* heath	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).	Reference material as above. 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 if necessary restore any areas of transition between this and communities which form other heathland-associated habitats, such as dry and humid heaths, mires, acid grasslands, 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.	Reference material as above.
Structure and function (including its typical	**Vegetation structure: cover of dwarf shrubs**	Maintain OR if necessary restore an overall cover of dwarf shrub species which is typically between 25-90%	Variations in the structure of the heathland vegetation (vegetation height, amount of canopy closure, and patch structure) is needed to maintain high niche diversity and hence high species richness of characteristic heathland plants and	Reference material as above. This attribute will be periodically monitored as part of Natural

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
species)			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 growing habits of its dominant species which in most cases will be ericoids (i.e. plants that look like heathers, including members of the *Ericaceae* and *Empetraceae* families). The ericaceous species heather or ling *Calluna vulgaris*, bell heather *Erica cinerea*, cross-leaved heath *Erica tetralix*, Dorset heath *Erica ciliaris*, Cornish heath *Erica vagans*, bilberry or blaeberry *Vaccinium myrtillus* and cowberry *Vaccinium vitis-idaea* are the commonest and most characteristic dwarf-shrubs. Hybrids of Dorset and cross leaved heath and of bilberry and cowberry can be locally abundant. *Calluna* is usually the most abundant. Crowberry *Empetrum nigrum*, another common species in some coastal and transitional heaths, is not strictly ericaceous but is often treated as an ericoid species.	England's SSSI condition assessments.
Structure and function (including its typical species)	**Vegetation composition: bracken cover**	Maintain a cover of dense bracken which is low, typically at <5%.	The spread of bracken Pteridium aquilinum is a 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 smaller and more characteristic heathland vegetation. Usually active management of bracken is required to reduce or contain its cover across this habitat feature. But this fern has also some nature conservation value, for example on sites where fritillary butterflies occur and utilise bracken litter habitat.	Reference material as above. 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 cover of common gorse *Ulex europaeus* at <25% and the combined cover of *U. europaeus* and *U. gallii* at <50%.	Gorse as a component of heathland is a very valuable wildlife habitat, and often a marker of relict heath and common. Both dense and spiny, it provides good, protected cover for many wildlife species: birds, mammals and reptiles; breeding habitat for rare or declining 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 gorse may cause problems if unchecked by dominating an area,	Reference material as above. 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)
			eliminating other typical heathland species. Mature stands en masse may also be serious fire hazards.	
Structure and function (including its typical species)	**Vegetation structure: tree cover**	Maintain OR if necessary restore 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 usually very important in providing warmth, shelter, cover, foodplants, perches, territorial markers and sources of prey for typical heathland invertebrates and vertebrates. But overall cover of scrub and trees across this habitat feature should be maintained or restored to a fairly sparse level, with a structurally complex edge and with characteristic heathland vegetation as ground cover. If scrub is locally important for any associated species with their own specific conservation objectives, then a higher level of cover will be acceptable. The area of scrub/tree cover should be stable or not increasing as a whole	Reference material as above. 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 if necessary restore a diverse age structure amongst the ericacerous shrubs typically found on the site.	Each phase of growth associated with the characteristic heathers which dominate this feature also represents different microclimatic conditions and microhabitats which may provide shelter or food to other organisms. Therefore, it is important to maintain a mosaic of heather in different phases of growth. Typically this age structure will consist of between 10-40% cover of (pseudo) pioneer heathers; 20-80% cover of building/mature heathers; <30% cover of degenerate heathers and less than <10% cover of dead heathers	This attribute will be periodically monitored as part of Natural England's SSSI condition assessments.
Structure and function (including its typical species)	**Vegetation: undesirable species**	Maintain the frequency/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.	Undesirable non-woody and 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. Undesirable species include: Hawthorn *Crataegus monogyna*, Blackthorn *Prunus spinosa*, European Gorse *Ulex europaeus*, Ash *Fraxinus excelsior*, Privet *Ligustrum ovalifolium*, Dogwood *Cornus sanguinea*, Bramble *Rubus fruticosus*, Bracken *Pteridium aquilinum*, Cotoneaster spp.	Reference material as above. 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)	**Key structural, influential and/or distinctive species**	Maintain OR if necessary restore 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 H8 heathland NVC vegetation types which comprise the H4030 feature within this SAC	Some plant or animal species (or related groups of such species) make a particularly important contribution to the structure, function and/or quality of an Annex I habitat feature at a particular site. These species will include; • Structural species which form a key part of the habitat's structure or help to define an Annex I habitat on a site (see also the attribute for 'vegetation community composition'). • Influential species which are likely to have a key role affecting the structure and function of the habitat (such as bioturbators (mixers of soil/sediment), grazers, surface borers, predators or other species with a significant functional role linked to the habitat). • Site-distinctive species which are considered to be a particularly special and distinguishing component of an Annex I habitat on a particular site. There may be natural fluctuations in the frequency and cover of each of these species. The relative contribution made by them to the overall ecological integrity of a site may vary, and Natural England will provide bespoke advice on this as necessary. The list of species given here for this Annex I habitat feature at this SAC is not necessarily exhaustive. The list may evolve, and species may be added or deleted, as new information about this site becomes available.	Reference material as above. This attribute will be periodically monitored as part of Natural England's SSSI condition assessments.
Structure and function (including its typical species)	**Functional connectivity with wider landscape**	Maintain OR if necessary restore 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. Structural connectivity refers to physical connections between habitat patches, often referred to as corridors, and functional connectivity is a measure of how easily species can move through the landscape and often relates to vegetation structure or management intensity. 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	Somerset Wildlife Trust (2016)Somerset's Ecological Networks report - See link:- http://www.somersetwildlife.org/hres/Somerset%20Ecological%20Networks%20Report%202016.pdf

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			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. Somerset's Ecological Networks report - Somerset Wildlife Trust 2016, provides a useful picture of the potential high quality habitats in and around the SAC, many of which support high quality calcareous grassland habitats. Many of the sites covered by North Somerset and Mendip Bat SAC along with various other key SSSIs including King and Middle Down SSSI (SWT), Bubwith Acres/Bradley Cross (SWT), Draycott Sleigh (SSSI) the Perch (SSSI) Axbridge and Frys Hill (SSSI) are important interconnecting sites. Somerset Wildlife Trust has only mapped the Ecological Networks in Somerset which means that, although ecological networks are represented at Brean Down and Shute Shelve Hill, much of the limestone grassland habitats between these two sites falls in North Somerset. Maps for North Somerset were produced by the West of England Nature Partnership http://www.wenp.org.uk/maps/. N.B. the methods used to produce these maps are different, so they may represent slightly different things.	
Structure and function (including its typical species)	**Adaptation and resilience**	Maintain OR if necessary restore 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	Natural England. 2015c. Climate Change Theme Plan and supporting NBCCV Assessments for SACs and SPAs. Available from http://publications.naturalengland.org.uk/publication/495459459137

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			example, which are likely to affect the extent, distribution, composition and functioning of a feature within a site. The vulnerability and response of features to such changes will vary. The vulnerability and response of features to such changes will vary. The overall vulnerability of this particular SAC to climate change has been assessed by Natural England as being Low. Despite having a lower vulnerability to climate change 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. 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.	5360
Structure and function (including its typical species)	**Soils, substrate and nutrient cycling**	Maintain OR if necessary restore 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.	Reference material as Extent attribute.
Supporting processes (on which the feature relies)	**Conservation measures**	Maintain OR if necessary restore the management measures (either within and/or outside the site boundary as appropriate) which are necessary to maintain OR if necessary restore 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	Natural England (2014) Mendip Limestone Grassland Site Improvement Plan provides useful details:-

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			management agreements. Management for this feature may include maintenance of low nutrient levels to maintain high numbers of species through the management activities of grazing, burning, mowing, sod-cutting and scrub/tree cutting. Management of succession is a critical aspect of management for this habitat, by a combination of active processes and grazing/cutting. A range of invertebrates and plants require bare ground/peat where it is not too frequently disturbed by vehicles or feet.	
Supporting processes (on which the feature relies)	**Air quality**	Maintain 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 (NH_3), oxides of nitrogen (NO_x) and sulphur dioxide (SO_2), 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).
Version Control Advice last updated: **18 February 2019**: Following stakeholder comments. Functional connectivity with wider landscape attribute reference added and more detail added to clarify attribute in				

Attributes	Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
supporting and explanatory notes.			
Variations from national feature-framework of integrity-guidance: The targets for some attributes listed above include both 'maintain' or 'restore' objectives. This is because this SAC is an extensive complex of geographically-separate component sites. Overall, both objectives will be applicable to the SAC but these will differ between each component site depending on its particular circumstances. Natural England will be able to provide further advice on request. Attributes for **Supporting processes – water quality** and **hydrology** have been deleted as they are not relevant to dry heaths as this feature is rain fed only.			

Table 2: Supplementary Advice for Qualifying Features: H6210. Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia); Dry grasslands and scrublands on chalk or limestone

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 if necessary restore the total extent of the feature to 158.21ha hectares. Brean Down 36ha CG1 and CG2 Crook Peak to Shute Shelve Hill 138ha CG1, CG2, CG4 Uphill Cliff 19ha CG1 and CG2 JNCC Standard data form 158.21ha	See the explanatory notes for this attribute above in Table 1 There are discrepancies between the Definition of Favourable Condition documents and the JNCC standard data form. Further surveys are required to define the exact extent of this feature.	Natural England (Various) Definitions of Favourable Condition for component SSSIs of Mendip Limestone Grassland SAC (Available on request from Natural England). National Trust (1987) Land Mark 2003-05 NVC report - Crook Peak NVC survey National Trust (1995) Brean Down NVC survey 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 OR if necessary restore 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	Reference material as above

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)	**Vegetation community composition**	Ensure the component vegetation communities of the feature are referable to and characterised by the following National Vegetation Classification types Calcareous grassland CG1 *Festuca ovina-Carlina vulgaris*, CG2 *Festuca ovina – Avenula pratensis* CG3 *Bromus erectus* grassland CG4 *Brachypodium pinnatum* grassland CG5 *Bromus erectus – Brachypodium pinnatum* 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).	Reference material as above This attribute will be periodically monitored as part of Natural England's SSSI condition assessments.
Structure and function (including its typical species)	**Vegetation: proportion of herbs (including Carex spp)**	Maintain OR if necessary restore the proportion of herbaceous species within the range 40%-90%	A high cover of characteristic herbs, including sedges (Carex species) is typical of the structure of this habitat type.	Reference material as above 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**	Maintain OR if necessary restore the abundance of the typical species listed below to enable each of them to be a viable component of the Annex 1	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;	Reference material as above 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)
	species	habitat; • Constant and preferential plant species of CG1, CG2, CG3, CG4 and CG5 grassland NVC vegetation types which comprise the H6120 feature within this SAC • Rare and scarce vascular plants typical of the oceanic southern temperate and Mediterranean elements of the British flora including include white rock-rose *Helianthemum apenninum*, Somerset hair-grass *Koeleria vallesiana*, Honewort *Trinia glauca*, *Aster linosyris* Goldilocks Aster, *Cerastium pumilum* Dwarf mousear, *Hornungia petraea Hutchinsia,* Cheddar Pink *Dianthus gratianopolitanus*, , Slender Bedstraw *Galium pumilum,* Carex humilis Dwarf sedge, Spring cinqfoil *Potentilla neumanniana*, Soft Brome *Bromus hordeaceus*	• 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 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	assessments.
Structure and function (including its typical species)	**Vegetation: undesirable species**	Maintain the frequency/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	There will be a range of undesirable or uncharacteristic species which, if allowed to colonise and spread, are likely to have an adverse effect on the feature's structure and function, including its more desirable typical species. These may include invasive non-natives such as Cotoneaster spp, or coarse and aggressive native species which may uncharacteristically dominate the composition of the feature.	Reference material as above. 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)
		Undesirable species no more than occasional throughout the sward or singly, or together more than 5% cover Invasive non-native species absent or no more than rare.	Undesirable species include Creeping/spear thistle *Cirsium arvense/vulgare*; Ragwort *Jacobaea vulgaris*; tussocky / course grasses including Yorkshire Fog *Holcus lanatus*; Curly Dock *Rumex crispus*; Broad-leaved dock *Rumex obtusifolius*; Nettle *Urtica dioica*; Cotoneaster spp, Invasive non-native species include Turkey Oak *Quercus cerris* and Holm Oak *Quercus ilex*	
Structure and function (including its typical species)	**Vegetation community transitions**	Maintain OR if necessary restore the pattern of natural vegetation zonations/transitions between woodland, grassland, and heathland	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.	Landmark (2005) Mendip Limestone Grassland NVC Survey, www.thelandmarkpractice.com
Structure and function (including its typical species)	**Soils, substrate and nutrient cycling**	Maintain OR if necessary restore 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.	
Structure and function (including its typical species)	**Supporting off-site habitat**	Maintain OR if necessary restore the extent, quality and spatial configuration of land or habitat surrounding or adjacent to the site which is known to support the feature	Sites do not exist in isolation. The structure and function of the qualifying habitat, including its typical species, may rely upon the continued presence of areas which surround and are outside of the designated site boundary. Changes in surrounding land-use may adversely (directly/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. Brean Down and Uphill Cliff are isolated, but Crook Peak to Shute Shelve Hill SSSI links in to Axbridge and Fry's Hill SSSI, Cheddar Wood SSSI & The Perch SSSI, and a suite of limestone grassland sites to the east.	Somerset's Ecological Networks report, SWT 2016 State of Environment, (Ecosystem services & ecological network maps) – West of England nature partnership 2013.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Structure and function (including its typical species)	**Functional connectivity with wider landscape**	Maintain OR if necessary restore 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. Structural connectivity refers to physical connections between habitat patches, often referred to as corridors, and functional connectivity is a measure of how easily species can move through the landscape and often relates to vegetation structure or management intensity. 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.	Referenced as above
Structure and function (including its typical species)	**Adaptation and resilience**	Maintain OR if necessary restore 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 explanatory notes for this attribute above in Table 1 Honewort, White Rockrose, Somerset Hairgrass are close to northern limit of range and may have potential to move east from Axbridge/Frys Hill (pers. comm. Bob Corns 2018).	
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 explanatory 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).
Supporting	**Conservation**	Maintain OR if necessary restore	Active and ongoing conservation management is needed to	Natural England (2014) Mendip

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
processes (on which the feature relies)	**measures**	the management measures (either within and/or outside the site boundary as appropriate) which are necessary to maintain OR restore the structure, functions and supporting processes associated with the feature	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.	Limestone Grassland Site Improvement Plan provides useful details
Version Control **18 February 2019**: Following stakeholder comments. Functional connectivity with wider landscape attribute reference added and more detail added to clarify attribute in supporting and explanatory notes. Within Vegetation undesirable species attribute Ragwort *Jacobaea vulgaris* latin name updated and species list updated to include more general "tussocky / course grasses including Yorkshire Fog".				
Variations from national feature-framework of integrity-guidance: The targets for some attributes listed above include both 'maintain' or 'restore' objectives. This is because this SAC is an extensive complex of geographically-separate component sites. Overall, both objectives will be applicable to the SAC but these will differ between each component site depending on its particular circumstances. Natural England will be able to provide further advice on request.				

Table 3: Supplementary Advice for Qualifying Features: H8310. Caves not open to the public

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 2.91 hectares.	See the explanatory notes for this attribute above in Table 1	JNCC standard data form (reference as above).
Structure and function (including its typical species)	**Naturalness**	Maintain the natural structure of the cave feature and ensure it can continue to evolve naturally	This should be interpreted as referring to natural caves which are not routinely exploited for tourism, and which host specialist or endemic cave species	Site Management Brief The Complete Caves of Mendip, Nicholas Barrington and William Stanton. English Nature (1994) Geological site documentation management brief – Crook Peak to Shute Shelve Hill (Available on request from Natural England).
Structure and function (including its typical species)	**Sedimentation**	Cave sediments are undisturbed and Maintain in an unmodified form, and increased sediment loadings from alterations of inflowing watercourses are avoided.	Whilst some fine sediments exist and are actively used by cave faunas, excessive and muddy waters seem to deplete populations.	
Structure and function (including its typical species)	**Key structural, influential and/or distinctive species**	Maintain OR if necessary restore the abundance of the typical species listed below to enable each of them to be a viable component of the Annex 1 habitat; Greater Horseshoe Bat *Rhinolophus ferrumequinum* Lesser Horseshoe Bat *Rhinolophus hipposideros*	See the explanatory notes for this attribute above in Table 1 Cavernicoles or cave-dwelling species associated with this Annex I habitat can include bacteria, algae, (often as key biofilms) fungi and various groups of invertebrates (e.g. insects, spiders and crustaceans).	Clarke Webb Ecology Ltd (2003) Survey of bat hibernation sites in the Mendip Hills, Jan 2002-Feb 2003.
Version Control Advice last updated: N/A				
Variations from national feature-framework of integrity-guidance: The following attributes were removed as they had no known relevance to the Caves not open to the public within this SAC: **Supporting process – illumination (there is no illumination), hydrology/water quality/woody debris (all dry caves).**				

Table 4: Supplementary Advice for Qualifying Features: H9180. Tilio-Acerion forests of slopes, screes and ravines; Mixed woodland on base-rich soils associated with rocky slopes *

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 if necessary restore the total extent of the feature to 19.93 hectares. Rose Wood and Kings Wood (W8) 26ha JNCC Standard data form 19.93ha	See the explanatory notes for this attribute above in Table 1 For this feature tree roots (particularly of veteran trees) can extend a considerable distance beyond the boundary of the site - they can be impacted by soil compaction (such as caused by vehicles or construction works); agricultural operations or other soil disturbance (like trenches); and agro chemicals or other chemicals which get into the soil. Any loss of woodland area - whether at the edge or in the middle of a site will reduce the core woodland area where woodland conditions are found - these support significant assemblages of species dependent on woodland conditions (e.g. lichens and bryophytes - being one example). Loss of any woodland area which fragments a site into different parts will clearly disturb the movement of species between the remaining parts of the woodland. In the absence of specific site surveys tailored to identifying extents of Tilio-acerion habitat, NVC community W8 has been used as a proxy to the Annex I habitat. This, in part, explains the discrepancy between the JNCC standard data form and the FCT figure. Further survey effort is needed to determine the proper extent of the Annex 1 habitat (and/or its proxy community W8 as no NVC maps are known to exist) since there are specific areas known to exhibit features such as slopes, screes and ravines, but these are as yet unmapped and undefined.	Natural England (2008) Definition of Favourable Condition - Crook Peak to Shute Shelve SSSI (Available on request from 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 OR if necessary restore 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	Natural England (2008) Definition of Favourable Condition - Crook Peak to Shute Shelve SSSI (Available on request from Natural England)

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			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. The feature is limited to Kings Wood and Rose Wood, units 2 & 4 of Crook Peak to Shute Shelve Hill SSSI.	
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 W8 – *Fraxinus excelsior – Acer campestre – Mercurialis perennis*	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. Chalara Ash die back (*Hymenoscyphus fraxineus*) is a concern for this site and may in the future result in changes to the vegetation composition.	Natural England (2008) Definition of Favourable Condition - Crook Peak to Shute Shelve SSSI (Available on request from Natural England) 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 OR if necessary restore an appropriate tree canopy cover across the feature, which will typically be between 30-90% of the 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 and soil. Open canopies with just scattered trees will have less of a woodland character and reduced diversity of woodland-dependent species (although they may be still be important as	Natural England (2008) Definition of Favourable Condition - Crook Peak to Shute Shelve SSSI (Available on request from 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)
			a form of woodland-pasture). Completely closed canopies across the whole woodland are not ideal either however, as they cast heavier shade and support fewer species associated with edges, glades and open grown trees, and have little space where tree regeneration could occur. In general, the woodland canopy of this feature should provide a core of woodland interior conditions with some open and edge habitat as well.	
Structure and function (including its typical species)	**Vegetation structure - open space**	Maintain OR if necessary restore areas of permanent/temporary open space within the woodland feature, typically to cover approximately 10%of area	Woodland structure includes variations in age, tree form, layering, the distribution and abundance of open space and dead wood. It plays a critical role in woodland ecosystem functioning. The targets set within this attribute should reflect the most appropriate structure for the woodland feature on a particular site, taking account of its known interest, history, past management and the landscape context. 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.	Natural England (2008) Definition of Favourable Condition - Crook Peak to Shute Shelve SSSI (Available on request from Natural England) 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 OR if necessary restore the extent and continuity of undisturbed, mature/old growth stands (typically comprising at least 10% of the feature at any one time) and the assemblages of veteran and ancient trees (typically 5-10 trees per hectare).	Good woodland structure includes variations in age, tree form, layering, the distribution and abundance of open space and dead wood. It plays a critical role in woodland ecosystem functioning. The targets set within this attribute should reflect the most appropriate structure for the woodland feature on a particular site, taking account of its known interest, history, past management and the landscape context. For this habitat type, old or over-mature elements of the woodland are particularly characteristic and important features, and their continuity should be a priority.	Natural England (2008) Definition of Favourable Condition - Crook Peak to Shute Shelve SSSI (Available on request from Natural England) This attribute will be periodically monitored as part of Natural England's SSSI condition assessments.
Structure and function	**Vegetation structure -**	Maintain OR if necessary restore the continuity and abundance of	Woodland structure includes variations in age, tree form, layering, the distribution and abundance of open space and	Natural England (2008) Definition of Favourable Condition -

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
(including its typical species)	**dead wood**	standing or fallen dead and decaying wood, typically between 30 - 50 m3 per hectare of standing or fallen timber or >2 fallen trees >20cm diameter per hectare, and >3 standing dead trees per hectare	dead wood. It plays a critical role in woodland ecosystem functioning. The targets set within this attribute should reflect the most appropriate structure for the woodland feature on a particular site, taking account of its known interest, history, past management and the landscape context.	Crook Peak to Shute Shelve SSSI (Available on request from Natural England) 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 OR if necessary restore at least 3 age classes (pole stage/ medium/ mature) spread across the average life expectancy of the commonest trees.	A distribution of size and age classes of the major site-native tree and shrub species that indicate the woodland will continue in perpetuity, and will provide a variety of the woodland habitats and niches expected for this type of woodland at the site in question.	Natural England (2008) Definition of Favourable Condition - Crook Peak to Shute Shelve SSSI (Available on request from Natural England) This attribute will be periodically monitored as part of Natural England's SSSI condition assessments.
Structure and function (including its typical species)	**Vegetation structure - shrub layer**	Maintain OR if necessary restore an understorey (2-5m) of shrubs over at least 20 of the stand area (this will vary with light levels and site objectives)	Woodland structure includes variations in age, tree form, layering, the distribution and abundance of open space and dead wood. It plays a critical role in woodland ecosystem functioning. The targets set within this attribute should reflect the most appropriate structure for the woodland feature on a particular site, taking account of its known interest, history, past management and the landscape context.	Natural England (2008) Definition of Favourable Condition - Crook Peak to Shute Shelve SSSI (Available on request from Natural England) 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**	Maintain OR if necessary restore a graduated woodland edge into adjacent semi-natural open habitats, other woodland/wood-pasture types or scrub.	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. Grasslands / arable fields managed with high doses of agro-	Land Mark (2005) Mendip Limestone Grassland NVC Survey, 2003-05, www.thelandmarkpractice.com

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			chemicals could potentially not allow this gradation of woodland edge and could have other impacts on the integrity of the site (pollution/ nutrient enrichment etc). Gradation present on east side of Rose Wood but not Kings Wood	
Structure and function (including its typical species)	**Adaptation and resilience**	Maintain OR if necessary restore the resilience of the feature by ensuring a diversity of site-native trees (at least 4 site native tree species) e.g. ash/ small-leaved lime/ aspen/ alder/ sycamore/ rowan/ bird cherry/ birch) is present across the site. At least 95% of cover in any one layer of site-native or acceptable naturalised species. Minimum levels of particular native tree/shrub species (where important and appropriate Death, destruction or replacement of native woodland species through effects of introduced fauna or other external unnatural factors not more than 10% by number or area in a five year period.	See the explanatory notes for this attribute above in Table 1 Chalara Ash die back (Hymenoscyphus fraxineus) is a concern for this site and may in the future result in changes to the vegetation composition.	Natural England (2008) Definition of Favourable Condition - Crook Peak to Shute Shelve SSSI (Available on request from Natural England)
Structure and function (including its typical species)	**Browsing and grazing by herbivores**	Maintain browsing at a (low) level that allows well developed understorey with no obvious browse line, & lush ground vegetation with some grazing sensitive species evident (bramble, ivy etc), and tree seedlings and sapling common in	Herbivores, especially deer, are an integral part of woodland ecosystems. They are important in influencing woodland regeneration, composition and structure and therefore in shaping woodland wildlife communities. In general, both light grazing and browsing is desirable to promote both a diverse woodland structure and continuous seedling establishment. Short periods with no grazing at all can allow fresh natural	Natural England (2008) Definition of Favourable Condition - Crook Peak to Shute Shelve SSSI (Available on request from Natural England)

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		gaps.	regeneration of trees, but a long-term absence of herbivores can result in excessively dense thickets of young trees which shade out ground flora and lower plant species. However, heavy grazing by deer or sheep prevents woodland regeneration, and can cause excessive trampling and/or poaching damage, canopy fragmentation, heavy browsing, barkstripping and a heavily grazed sward.	
Structure and function (including its typical species)	**Regeneration potential**	Maintain OR if necessary restore the potential for sufficient natural regeneration of desirable trees and shrubs; typically tree seedlings of desirable species (measured by seedlings and <1.3m saplings - above grazing and browsing height) should be visible in sufficient numbers in gaps, at the wood edge and/or as regrowth as appropriate	The regeneration potential of the woodland feature must be maintained if the wood is to be sustained and survive, both in terms of quantity of regeneration and in terms of appropriate species. This will Include regeneration of the trees and shrubs from saplings or suckers, regrowth from coppice stools or pollards, and where appropriate planting. Browsing and grazing levels must permit regeneration at least in intervals of 5 years every 20. The density of regeneration considered sufficient is less in parkland sites than in high forest. Regeneration from pollarding of veteran trees should be included where this is happening.	Natural England (2008) Definition of Favourable Condition - Crook Peak to Shute Shelve SSSI (Available on request from Natural England) 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 if necessary restore 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 W8 woodland NVC vegetation types which comprise the H9180 feature within this SAC	See the explanatory notes for this attribute above in Table 1 Tilio-Acerion ravine forests are woods of ash *Fraxinus excelsior*, wych elm *Ulmus glabra* and lime (mainly small-leaved lime *Tilia cordata* but more rarely large-leaved lime *T. platyphyllos*). This habitat type is ecologically variable, particularly with respect to the dominant tree species. Ash and wych elm are important in the canopy, and lime may be completely absent. The ground flora can be very varied, but the following elements are usually present: fern banks (particularly hart's-tongue *Phyllitis scolopendrium*, soft shield-fern *Polystichum setiferum* and buckler-ferns *Dryopteris spp*.); stands of ramsons *Allium ursinum* in the moister zones; dog's mercury *Mercurialis perennis* and enchanter's-nightshade *Circaea* spp. on drier but still base-rich soils; wood avens *Geum urbanum*, and natural 'disturbance communities' comprising common nettle *Urtica dioica*, herb-Robert *Geranium robertianum* and cleavers *Galium aparine* associated with	Somerset Environment Records Centre - http://www.somerc.com Botanical Society of Britain and Ireland (BSBI) data: https://bsbi.org

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			scree and cliff-bases. A wide range of other basiphilous herbs and grasses may occur within these stands. The main NVC types conforming to Tilio-Acerion forests are the 'western' forms (sub-communities d-g) of W8 *Fraxinus excelsior – Acer campestre-Mercurialis perennis* woodland Tilio-Acerion forests provide a habitat for a number of uncommon vascular plants, including, purple gromwell *Lithospermum purpureocaeruleum* and herb-Paris *Paris quadrifolia.* Chalara Ash die back (*Hymenoscyphus fraxineus*) is a concern for this site and may in the future result in changes to the vegetation composition.	
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 can include Rhododendrons, snowberry, Japanese knotweed, giant hogweed and Himalayan balsam, for example. Similarly, this would include pheasants, rabbits and non-native invertebrate 'pest' species. The consideration of what is 'introduced non-native' has become more complex in the light of the likely impacts of *Chalara* ash dieback. It is likely that species such as Sycamore and Beech, whilst not usually considered a native component of ancient woodland in this area, may have to move to an accepted naturalised status to retain a broad enough mix of acceptable species and spread the risk of possible future diseases.	Natural England (2008) Definition of Favourable Condition - Crook Peak to Shute Shelve SSSI (Available on request from Natural England) Natural England (2014) Mendip Limestone Grassland Site Improvement Plan provides useful details Natural England (2009) Guidance on dealing with the changing distribution of tree species. Technical Information Note TIN053 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)
			A continuing watching brief should be the default on the status of *Chalara* and the possible impacts of these substitute species on individual sites. Other non-native spp. Like Holm oak, Turkey oak, Rhododendron and Laurel are or could become an issue within the woodlands and work should be completed to control and where possible eradicate them.	
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 OR if necessary restore 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. Structural connectivity refers to physical connections between habitat patches, often referred to as corridors, and functional connectivity is a measure of how easily species can move through the landscape and often relates to vegetation structure or management intensity. 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	Somerset's Ecological Networks report, SWT 2016 State of Environment, (Ecosystem services & ecological network maps) – West of England nature partnership 2013.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			advise as to whether these are applicable on a case by case basis.	
Supporting processes (on which the feature relies)	**Air quality**	Maintain OR if necessary 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 explanatory 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).
Supporting processes (on which the feature relies)	**Illumination**	Ensure artificial light is maintained at a level which is unlikely to affect natural phenological cycles and processes to the detriment of the feature and its typical species at this site.	Woodland biodiversity has naturally evolved with natural patterns of light and darkness, so disturbance or modification of those patterns can influence numerous aspects of plant and animal behaviour. For example, light pollution (from direct glare, chronically increased illumination and/or temporary, unexpected fluctuations in lighting) can affect animal navigation, competitive interactions, predator-prey relations, and animal physiology. Flowering and development of trees and plants can also be modified by un-natural illumination which can disrupt natural seasonal responses. Illumination is not currently an issue at this SAC	

Version Control
Advice last updated:
18 February 2019: Following stakeholder comments. Functional connectivity with wider landscape attribute reference added and more detail added to clarify attribute in supporting and explanatory notes. Chalara Ash die back (*Hymenoscyphus fraxineus*) is a concern for this site and may in the future result in changes to the vegetation composition included throughout table.

Variations from national feature-framework of integrity-guidance:
The targets for some attributes listed above include both 'maintain' or 'restore' objectives. This is because this SAC is an extensive complex of geographically-separate component sites. Overall, both objectives will be applicable to the SAC but these will differ between each component site depending on its particular circumstances. Natural England will be able to provide further advice on request.

The following attributes were removed as they had no known relevance to the Greater Horseshoe bats within this SAC:
Supporting processes – hydrology (all dry woods above water table).

Table 5: Supplementary Advice for Qualifying Features: S1304. *Rhinolophus ferrumequinum*; Greater horseshoe bat

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Population (of the feature)	Population abundance - hibernation site	Maintain OR if necessary restore the abundance of the hibernating population at/to a level which is above the population recorded in the Jan 2002-03 Survey of bat hibernation sites in the Mendip Hills, Clarke Webb Ecology Ltd, whilst avoiding deterioration from its current level Foxes Hole (1 bat, 2002) Supra Sandy Hole (1 bat, 1999), Axbridge Ochre Cavern (2 bats, 2002), Denny's Hole (2 bats, 2000), Sandy Cave 1 bat, 2002), Shute Shelve Cavern 1 bat, 1999)	This will ensure there is a viable population of the feature which is being maintained at or increased to a level that contributes as appropriate 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. 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. 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.	Jan 2002-03, Survey of bat hibernation sites in the Mendip Hills, Clarke Webb Ecology ltd

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Supporting habitat: extent and distribution	Distribution of supporting habitat	Maintain OR if necessary restore 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. Connectivity between sites is important as the bats navigate using linear features particularly such as hedgelines, walls and ditches. They use many caves within Somerset and migrate quite large distances including flying to and from Gloucestershire and Devon. It was found that the Greater Horseshoe Bats used 76 different sites on Mendip in one year. Mapping has been undertaken to find where the distribution of ecological networks are fragmented to enable bodies to find funding to work on linking up habitats such as species rich grassland and woodland. The CORE toolbox developed by Forest Research and Somerset Wildlife Trust allows ecological network maps to be assessed for coherence and resilience. This method highlights where ecological networks are fragmented and where creation or restoration work could link up habitats such as species rich grassland and woodland. Studies have also shown that Greater Horseshoe Bats use hedges, walls and ditches to navigate, foraging over grassland which is grazed by animals, providing insects such as dung beetles See above notes regarding extent also valid for distribution with particular importance placed on the location of suitable foraging habitat directly around and close to maternity sites.	Referenced as above State of the Environment – Ecosystem Services and Ecological Network Maps, West of England Nature Partnership 2013 http://www.wenp.org.uk/state-of-environment/ Natural England (2014) North Somerset and Mendip Bat SAC Site Improvement Plan (SIP) Somerset's Ecological Networks, Somerset Wildlife Trust 2016 http://www.somerset.gov.uk/policies-and-plans/policies/ecological-networks/ Survey of Bat Hibernation sites in the Mendip Hills, Clarke Webb Ecology February 2003

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Supporting habitat: extent and distribution	Extent of supporting habitat	Maintain OR if necessary restore the total extent of the habitat(s) which support the feature. Grasslands, Tilio-Acerion forests of slopes, screes and ravines; Mixed woodland on base-rich soils associated with rocky slopes, Other woodland, scrub and hedges, heathland of 415.24ha.	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 information available on the extent and distribution of supporting habitat used by the feature may be approximate depending on the nature, age and accuracy of data collection, and may be subject to periodic review in light of improvements in data. Adult bats are known to forage over a larger area, Although the SAC includes the SSSIs noted here, their supporting habitat includes a large range of surrounding sites. It is especially important that grazing of this area particularly with cattle continues to provide invertebrates for the bats to eat.	Referenced as above Paul Lauret Duverge (1996) Foraging activity, habitat use, development of juveniles and diet of the Greater Horseshoe bat in South West England,.
Supporting habitat: structure/ function	Flightlines from roost into surrounding habitat and foraging areas	Maintain OR if necessary restore the presence, structure and quality of any linear landscape features which function as flightlines. Flightlines should remain unlit, functioning as dark corridors.	Non-breeding greater horseshoe adults can forage up to 4km from roost sites. For breeding females and juveniles, the distance tends to be roughly half this i.e. 2km (English Nature, 2003). Greater horseshoes commute and forage along linear features, over grazed pasture and in woodland. Permanent pasture and ancient woodland linked with an abundance of tall bushy hedgerows is ideal supporting habitat for this species. (English Nature, 2003). Flightlines will extend beyond the designated site boundary into the wider local landscape.	Clarke Webb Ecology Ltd (2003), Survey of bat hibernation sites in the Mendip Hills,
Supporting habitat: structure/ function	Roost access	Maintain OR if necessary restore 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 accesses	This will prevent any negative internal climatic changes within the roost and maintain the ability of bats to freely enter and leave the roost as necessary. Normal minima dimensions for horseshoe access points; greater horseshoes 400 x 300mm	Surveys are carried out by licenced persons and organisations for NE – This info is sensitive and requirements for it must be discussed with Natural England
Supporting habitat: structure/ function	Soils, substrate and nutrient cycling	Maintain OR Restore the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungal:	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	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		bacterial ratio, within typical values for the supporting habitat	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	External condition of underground site - hibernation	Maintain the structural integrity of the roost space, with no recent collapses/falls or signs of geological instability. Maintain vegetation close to the entrance but not obstructing it.	Damp, draught and increases in light levels are likely to have a negative effect on the temperature and humidity of the roost. Vegetation is required close to the entrance to enable bats to feel secure enough to leave at dusk rather than delaying until fully dark. Any lights shining on the entrance are likely to deter the bats from leaving (Downs et al 2003; Stone, Jones & Harris 2009).	Downs NC, et al (2003) The effects of illuminating the roost entrance on the emergence behaviour of Pipistrellus pygmaeus, Biological Conservation, 111, p247-252. Natural England SSSI citations and condition assessments available from https://designatedsites.naturalengland.org.uk/
Supporting processes (on which the feature and/or its supporting habitat relies)	Adaptation and resilience	Maintain OR if necessary restore 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 explanatory notes for this attribute above in Table 1 The Greater Horseshoe bats are at the northern edge of their European range. With climate change it is expected that their range boundary may move further North. It has been shown that the population expansion of the Greater Horseshoe bat has been driven by climate change rather than any conservation or habitat management. (Froidevaux et al) Temperature regulation within roost/hibernation sites or the availability of roosts with a variety of temperature and humidity regimes is important to ensure the continued availability of suitable roosts. There may be a decrease in hunting ability with an increase in wet weather as bats avoid hunting in heavy rain due to increased energy costs (Voigt et al 2011).	Referenced as above SHERWIN HA, MONTGOMERY WI & LUNDY MG (2013), The Impact and Implications of Climate Change for Bats, Mammal Review, 43, p171-182. Voigt CC et al (2011), Rain Increases the Energy Cost of Bat Flight, Biology Letters, 7, p793-795. Froidevaux, S.P; Boughey, K.L; Barlow, K.E; and Jones, G (2017 Factors driving population recovery of the greater horseshoe bat (Rhinolophus ferrumequinum) in the UK: implications for conservation

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			Changing vegetation around caves/mines may affect humidity of the hibernation site and the availability of food during winter emergence. Wider landscape changes in vegetation my also affect food availability and flightlines between foraging areas. Climate change resilience will be aided by the protection and maintenance/restoration of quality feeding habitat close to the roosts and the identification and protection of satellite roosts and their surrounding habitat to enable sufficient feeding to occur during sub-optimal weather conditions.	
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 explanatory 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).
Supporting processes (on which the feature and/or its supporting habitat relies)	Conservation measures	Maintain OR if necessary restore the management measures (either within and/or outside the site boundary as appropriate) which are necessary to Maintain OR if necessary restore the structure, functions and supporting processes associated with the feature and/or its supporting habitats.	See the explanatory notes for this attribute above in Table 1 Management for this site includes maintaining grills to hibernation entrances, maintaining appropriate wooded cover around entrances, maintaining and restoring flight-lines and feeding grounds and protecting swarming sites associated with the SAC bat population and flight-lines to swarming sites.	JNCC data sheet Component SSSI FCTs Land Mark 2003-05 NVC report Jan 2002-03, Survey of bat hibernation sites in the Mendip Hills, Clarke Webb Ecology Referenced as above
Supporting processes (on which the feature and/or its supporting habitat relies)	Disturbance from human activity	Control and minimise human access to roost sites	Site should be secured against 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 on site access points should be maintained where present.	Jan 2002-03, Survey of bat hibernation sites in the Mendip Hills, Clarke Webb Ecology ltd
Version Control: Advice last updated: **18 February 2019**: Following stakeholder comments. In distribution of supporting habitat attribute more detail added to clarify attribute in supporting and explanatory notes including explanation of CORE toolbox designed by Somerset Wildlife Trust and Forest Research.				

Attributes	Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Variations from national feature-framework of integrity-guidance: The targets for some attributes listed above include both 'maintain' or 'restore' objectives. This is because this SAC is an extensive complex of geographically-separate component sites. Overall, both objectives will be applicable to the SAC but these will differ between each component site depending on its particular circumstances. Natural England will be able to provide further advice on request. The following attributes were deleted as they had no known relevance to the Greater Horseshoe bats within this SAC: **Water quantity/quality** – feature is not considered dependent on water quality / quantity during the hibernation period. **External & Internal condition of the building – hibernation & roost site** – all roosts are located within caves. **Population abundance – maternity colony** All attributes relating to maternity colonies are deleted as there are not thought to be breeding greater horseshoe bats present within the SAC.			