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

Wye Valley Woodlands/ Coetiroedd Dyffryn Gwy Special Area of Conservation (SAC) Site code: UK0012727

Taken from Eagle's nest looking towards the mouth of the Wye, showing Wyndcliff Wood in foreground, Lower Wye Gorge SSSI on the English side of the river (left) and Piercefield SSSI on the Welsh side (right) © Juliet Hynes/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 Wye Valley Woodlands/ Coetiroedd Dyffryn Gwy SAC. This advice should therefore be read together with Natural England's SAC Conservation Objectives.

This site is adjacent to and functionally overlaps with the River Wye SAC (Conservation objectives and Supplementary Advice available here) and the Wye Valley and Forest of Dean Bat Sites SAC (Conservation objectives and Supplementary Advice available here).

This advice replaces a draft version dated 8 November 2018 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 advice currently applies to those parts of the SAC lying in England. You should seek the advice of Natural Resources Wales separately.

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	Wye Valley Woodlands/ Coetiroedd Dyffryn Gwy Special Area of Conservation (SAC)
Location	Gloucestershire, Herefordshire, Monmouthshire.
Site Maps	The designated boundary of this site can be viewed here on the MAGiC website
Designation Date	April 2005
Qualifying Features	See section below
Designation Area	913.32 hectares
Designation Changes	n/a
Feature Condition Status	Details of the feature condition assessments made at this site can be found using Natural England's Designated Sites System
Names of component Sites of Special Scientific Interest (SSSIs)	**England:** Astridge Wood SSSI Bigsweir Wood SSSI Highbury Wood SSSI Lower Wye Gorge SSSI Shorn Cliff and Caswell Wood SSSI Swanpool Wood and Furnace Grove SSSI The Hudnalls SSSI **Wales:** Blackcliff - Wyndcliff SSSI Cleddon Shoots Woodland SSSI Fiddler's Elbow SSSI Graig Wood SSSI Harper's Grove – Lord's Grove SSSI Livox SSSI Lower Hael Wood SSSI Pierce, Alcove & Piercefield Woods SSSI **Cross Border:** Upper Wye Gorge SSSI
Relationship with other European or International Site designations	The boundary of this SAC is adjacent to and, in some locations, overlaps with the River Wye SAC. This SAC also functionally overlaps with the Wye Valley and Forest of Dean Bat Sites SAC.

Site background and geography

The Wye Valley Woodland SAC is a large cross border site lying within the Forest of Dean and Lower Wye National Character Area and shared between Wales and England. The component woodland blocks of the SAC significantly contribute towards the connectivity of a near continuous semi-natural woodland corridor running the length of the Wye Gorge between Chepstow and Monmouth. The underlying limestone and steep topography of the gorge dictates much of the habitat, though in places this levels out and blends into the more acidic Devonian sandstone soils of the wider area. In places the underlying limestone and accompanying hydrology results in the emergence of tufa springs.

An almost continuous belt of woodland cloaks the valley sides and spreads out on to the surrounding hills. The woodland in the Wye Valley is an obvious component of the landscape, and combined with adjacent woodlands such as the Forest of Dean and Wentwood, make this one of the most densely forested parts of the UK (Peterken, 2008). Coupled with other semi-natural habitats within the area this is a diverse and wildlife rich area which also supports a number of species that are at the edge of their ecological range.

Underpinned by a total of sixteen Sites of Special Scientific Interest (SSSI) (all of which lie entirely within the SAC), eight of the SSSIs are located entirely within Wales and seven entirely within England. The remaining SSSI – Upper Wye Gorge SSSI - is a cross-border site. The SSSIs that form the SAC have been selected as having the best examples of Tilio-Acerion forests of slopes, screes and ravines, Asperulo-Fagetum Beech forests and *Taxus baccata* woods of the British Isles in the United Kingdom.

The woodlands are also known to be important for Lesser Horseshoe Bats *Rhinolophus hipposideros*, which use the woodlands for roosting and for foraging.

The majority of the broadleaved woodland stands within the Wye Valley Woodland SAC comprise re-growth or standards over derelict coppice dating from the Second World War. Many stands have developed a high forest structure due to the cessation of woodland management. Some of the more inaccessible areas, such as steep cliffs, support older generally unmanaged woodland. Much of the Yew *Taxus baccata* woodland is also pre-Second World War in origin.

The ownership across the SAC ranges from private to non-governmental conservation organisations and governmental bodies (Natural England and Natural Resources Wales), resulting in a varied state of current management across the SSSIs.

There are four National Nature Reserves within the SAC: Lady Park Wood, Highbury Wood and The Hudnalls managed by NE and Fiddler's Elbow managed by NRW.

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:

The habitat of the lower Wye Valley is ecologically variable as a result of the complex topography (slope, aspect) and nature of substrate. This results in a rich mosaic of different woodland vegetation types and makes the assignment of them to Annex 1 habitat types difficult on some of the component sites. As a result, the SAC includes those woodland types that, due to the presence of key species throughout, are considered to have a close association with the Annex 1 habitat types and are included as part of the SAC's designated area. For example, some stands of the oak-dominated NVC type W10 (W10a, b, c, e) contain large amounts of Lime, Ash and Beech indicative of a modified woodland type with close association to W8 and W12 woodland that forms part of the Annex I habitats.

There are also areas of Plantation on Ancient Woodland Sites (PAWS), beech and small areas of conifer plantation, both within and adjacent to the SAC which are part of ongoing woodland restoration work.

- **H9130 Asperulo-Fagetum beech forests ('Beech forests on neutral to rich soils')**

  This Annex I type typically occurs on circumneutral to calcareous soils. Beech stands occur as part of a mosaic with a wide range of other woodland types, and represent the western range of Asperulo-Fagetum beech forests. Such a variety of woodland types is rare within the UK. In places lime *Tilia* sp., elm *Ulmus* sp. and oak *Quercus* sp. share dominance with the beech. Structurally the woods include old coppice, pollards and high forest types.

  Some areas of beech plantation remain on native woodland sites, particularly at Upper Wye Gorge. Lady Park Wood, one of the SAC's component sites, is an outstanding example of near-natural old-growth structure in mixed broad-leaved woodland, and has been the subject of detailed long-term monitoring studies (http://www.jncc.gov.uk).

  This habitat type at this SAC corresponds with the NVC type W12 *Fagus sylvatica- Mercurialis perennis* woodland and also more calcareous stands of NVC W14 *Fagus sylvatica – Rubus fruticosus* woodland. On some of the English sites, areas of W10 oak stands are also included.

- **H9180 Tilio-Acerion forests of slopes, screes and ravines* (Priority feature) 'Mixed woodland on base-rich soils associated with rocky slopes'**

  These ravine forests are typically 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.

  The woods of the lower Wye Valley provide the most extensive examples of Tilio-Acerion forest in the west of its range. A wide range of ecological variation is associated with slope, aspect and landform. The woodland occurs here as a mosaic with other types, including beech *Fagus sylvatica* and pedunculate oak *Quercus robur* stands. Uncommon trees, including large-leaved lime *Tilia platyphyllos* and rare whitebeams such as *Sorbus porrigentiformis* and *S. rupicola* are found here, as well as locally uncommon herbs, including wood barley *Hordelymus europaeus*, stinking hellebore *Helleborus foetidus*, narrow-leaved bitter-cress *Cardamine impatiens* and wood fescue *Festuca altissima*.

NVC types include W8 *Fraxinus excelsior – Acer campestre – Mercurialis perennis* woodland, W8d-f (*Anemone nemorosa, Deschampsia cespitosa, Hedera helix, Geranium robertianum or Allium ursinum* sub-community), W9 *Fraxinus excelsior – Sorbus aucuparia – Mercurialis perennis* woodland.

- **H91J0 *Taxus baccata* woods of the British Isles; 'Yew-dominated woodland'* (Priority feature)**

  Yew *Taxus baccata* woodland typically occurs on shallow, dry soils usually on chalk or limestone slopes, but in a few areas stands on more mesotrophic soils are found. The habitat is classified as NVC type W13 *Taxus baccata* woodland. Within this community yew tends to be overwhelmingly dominant and is usually associated with a very sparse shrub and tree layer. Only a few species, such as dog's mercury *Mercurialis perennis*, can survive beneath the dense shade cast by the canopy of mature yew trees.

  Wye Valley is representative of yew *Taxus baccata* woods in the south-west of the habitat's range. It lies on the southern Carboniferous limestone, and yew occurs both as an understorey to other woodland trees and as major yew-dominated groves, particularly on the more stony slopes and crags.

  The NVC type for *Taxus baccata* woods is W13 woodland type. There are also areas of W12c (*Taxus baccata* sub-community) which are included under the Asperulo-Fagetum beech forests.

Qualifying Species:

- **S1303 Lesser horseshoe bat *Rhinolophus hipposideros***

  The lesser horseshoe bat *Rhinolophus hipposideros* is one of the smallest bats in the UK. During the summer they form maternity colonies in old buildings and emerge to hunt in nearby woodland including the SAC woodland. In winter they hibernate in caves, mines and other cave-like places. Summer and winter roosts are usually less than 5-10 km apart.

  The species prefers sheltered valleys with extensive deciduous woods or dense scrub close to roost sites. Where habitat is fragmented, linear features such as hedgerows are important corridors between roosts and foraging areas. The bats are vulnerable to the loss or disturbance of both summer and winter roost sites and the removal of linear habitat corridors that connect them to feeding grounds.

  Horseshoe bats feed on insects, which from late autumn to spring are either in short supply or unavailable. The animals survive this period by hibernating. Lowering their body temperature saves energy and allows them to live on the fat accumulated during the late summer and early autumn. However, hibernation is not a completely static time and the bats will emerge to drink and feed if the weather conditions are favourable. Late autumn and early winter are also the times when most mating takes place. As horseshoe bats emerge from hibernation at the end of April, the females group together in buildings to form maternity colonies.

  In the UK bats tend to hibernate in places with cool stable temperatures and high humidity, such as caves, mines, the cellars of buildings and disused railway tunnels. Bats tend to move between hibernacula during the winter responding to changes in ambient temperature. Lesser horseshoe bats roost mainly in underground sites during winter, often communally. They are usually found in hibernation sites with relative humidity over 90%.

  Hibernation caves and mines are abundant in the limestone of the Wye Valley and coal measures of the adjacent Forest of Dean. Caves in the wooded gorge areas are ancient sea caves now perched high above the river level, many of these caves have been excavated and subject to mining for iron ore. Lesser horseshoe bats are included in the SAC as a significant number hibernate in its numerous caves.

The lesser horseshoe bat is also 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 from either Natural England or Natural Resources Wales for any activities likely to harm or disturb the bats.

References

NATURAL RESOURCES WALES' (2008) Core Management Plan for Wye Valley Woodlands SAC.
PETERKEN, G. (2008). *The Wye Valley*. The New Naturalist Library: A Survey of British Natural History - Book No. 105. Collins.
RODWELL, J.S. (ed.) (1991) *British Plant Communities. Volume 1. Woodlands and scrub*. Cambridge University Press.

Table 1: Supplementary Advice for Qualifying Features: H9130. Asperulo-Fagetum beech forests; Beech forests on neutral to rich soils

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Extent and distribution of the feature	**Extent of the feature within the site, including woodland-pasture sites with many old trees**	Restore the total extent of the H9130 feature to 195.1 hectares. Within this, maintain the total extent of the woodland-pasture structure to 12.5 hectares subject to natural changes.	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 or condition of the feature may be restored through the conversion of PAWS (beech plantation or conifer) to a more natural woodland structure. 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/Natural Resources Wales will advise on this on a case-by-case basis. For this feature, this attribute includes the extent of semi-natural wood-pasture mosaic area; treed area; the number of veteran trees (except through natural causes), including dead and living trees. Tree roots (particularly of veteran trees) may extend a considerable distance beyond the boundary of the site. A reduction of woodland/wood-pasture area - whether at the edge or in the middle of a site will reduce the core area where wood-pasture conditions are found - these support significant assemblages of species dependent on woodland conditions (e.g. lichens and bryophytes). Loss of any woodland area which fragments a site into different parts may interrupt the movement of species between the remaining parts of the woodland, especially those with limited powers of dispersal.	NATURAL ENGLAND/NATURAL RESOURCES WALES NATURAL ENGLAND WILKINSON , K. (2013a)

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Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Extent and distribution of the feature	**Spatial distribution of the feature within the site**	Maintain the distribution and configuration of the H9103 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. 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. The distribution of core areas across the SAC should be maintained, but there can be some natural flexibility over wider distribution. With Ash dieback there will inevitably be some change.	NATURAL RESOURCES WALES (2008)
Structure and function (including its typical species)	**Vegetation structure - canopy cover**	Restore an appropriate tree canopy cover across the H9130 feature, which will typically be between 60-90% on the steeper minimum intervention areas and 30-90% elsewhere across the sites.	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, litter-fall, 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 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. Although this SAC has allowance in the target for a denser canopy due to the nature of ravine woodland being harder to manage, the condition	NATURAL ENGLAND WILKINSON , K. (2013a)

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Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			assessments show that the density of the canopy is preventing regeneration in some units, therefore the target is to restore.	
	Vegetation structure - canopy cover (for woodland-pasture sites with many old trees)	Maintain a canopy of open grown native trees with free crowns over between 20-80% of the site as appropriate.	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, litter-fall, 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 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.	NATURAL ENGLAND
Structure and function (including its typical species)	**Vegetation structure - open space**	Restore areas of permanent or temporary open space within the woodland feature, typically to cover a minimum of 10% of the whole SAC area at any one time	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 what the most appropriate structure is 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 canopy gaps caused by disturbance events such as windthrow/fire/tree falling over/snow damage. A restoration target is appropriate for both permanent open space, e.g. limestone outcrops at Upper Wye Gorge, and temporary open space,	NATURAL ENGLAND WILKINSON , K. (2013a) NATURAL ENGLAND NATURAL RESOURCES WALES (2008)

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Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			which is lacking in some units leading to unfavourable condition status as limiting natural regeneration.	
	Vegetation structure - open space (for woodland pasture with old trees)	Maintain areas of permanent or temporary open space within the woodland feature, typically to cover approximately 20%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 what the most appropriate structure is 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.	
Structure and function (including its typical species)	**Vegetation structure - old growth**	Restore the extent and continuity of undisturbed, mature/old growth stands and the assemblages of veteran and ancient trees.	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. 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. Due to the steep nature of the gorge woodland and the historic coppicing of much of the woodland, there are only a few scattered veteran or ancient trees. In this case management is targeted at identifying and developing future veterans and assigning minimum intervention areas which will allow mature/over mature woodland to develop. Some areas of relatively-undisturbed mature/old growth stands or a scatter of large trees allowed to grow to over-maturity/death on site (e.g. a minimum of 10% of the woodland or 5-10 trees per ha). Areas of Upper Wye Gorge, Highbury, Lower Wye Gorge, Caswell Woods and The Hudnalls are minimum intervention. Lady Park wood is the only area of non-intervention woodland.	NATURAL ENGLAND NATURAL RESOURCES WALES (2008)

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Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
	Vegetation structure - old growth (for woodland pasture sites with many old trees)	Maintain the extent and continuity of undisturbed, mature/old growth stands (typically comprising at least 20% of the feature at any one time) and the assemblages of veteran and ancient trees (typically >10 trees per hectare).	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 what the most appropriate structure is 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. This objective is only applicable to Upper Wye Gorge SSSI unit 7 within the SAC.	
Structure and function (including its typical species)	**Vegetation structure - dead wood**	Restore the continuity and abundance of standing or fallen dead and decaying wood at a minimum of 3 fallen trees >30cm and 4 standing trees >10cm diameter per ha.	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 what the most appropriate structure is for the woodland feature on a particular site, taking account of its known interest, history, past management and the landscape context. Dead and actively decaying wood, either as part of a standing tree or as a fallen tree on the woodland floor, is an important component of woodland ecosystems, and supports a range of specialist invertebrates, fungi, lichens and bryophytes, and associated hole-nesting birds and roosting bats, all of which may be very typical of the feature. Due to the historic coppice management and lack of ancient trees, the target is set slightly lower than it might be on other SACs. However, the long term aim should be to increase the number of veteran trees and dead wood.	NATURAL ENGLAND NATURAL RESOURCES WALES (2008)
	Vegetation structure - age class distribution	Restore at least 3 age classes (pole stage/ medium/ mature) to the H9130 feature 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. In some cases the historic management (abandoned coppice) may mean that the age structure is limited. Deer browsing in some areas is also limiting regeneration and therefore the quantity of the lowest age class.	NATURAL ENGLAND NATURAL RESOURCES WALES (2008) NATURAL ENGLAND WILKINSON , K. (2013a)

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Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
	Vegetation structure - shrub layer (for woodland pasture sites with many old trees)	Restore an understorey of shrubs and trees covering [15 - 30%] of the site (this will vary with light levels and levels of grazing).	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 what the most appropriate structure is for the woodland feature on a particular site, taking account of its known interest, history, past management and the landscape context. There is more opportunity for growth of scrub or young tree growth in wood-pasture sites because of higher light levels. There is very little understory within the Little Doward woodland-pasture area, restoration is required through deer control and removal of, or less intensive grazing by, stock.	NATURAL ENGLAND
Structure and function (including its typical species)	**Vegetation structure - Woodland edge (graduated edge; buffered; mosaics with other habitats)**	Restore a graduated woodland edge to the H9130 feature 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. Although some areas of the gorge woodlands do not have scope for graduated edge due to the topography, some sites would benefit from restoration of a more graduated edge where it is adjacent to pasture.	
	Functional connectivity with wider landscape	Restore the overall extent, quality and function of any supporting features within the local landscape which provide a critical functional connection with the H9130 feature	This recognises the potential need at this site to maintain or restore the connectivity of the site to its wider landscape in order to meet the conservation objectives. These connections may take the form of landscape features, such as habitat patches, hedges, watercourses and verges, outside of the designated site boundary which are either important for the migration, dispersal and genetic exchange of those typical species closely associated with qualifying Annex I habitat features of the site. These features may also be important to the operation of the supporting ecological processes on which the designated site and its features may rely. In most cases increasing actual and functional landscape-scale connectivity would be beneficial The component sites of the SAC are part of a much larger area of contiguous woodland, the structure and function of these component	NATURAL ENGLAND. Priority habitats inventory (England) (2015) Available from https://data.gov.uk/ FORESTRY COMMISSION. National forest inventory (GB) (2016). Available from http://data-forestry.opendata.arcgis.com/

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Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			sites would be greatly altered if the adjacent areas of woodland were lost. Management of, and PAWS restoration in, the surrounding woodland can also benefit the SAC. Some species may only be present because of the extensive area of woodland. Grassland, orchards and hedgerows also form part of the wider ecological network that increases the resilience of this site.	
	Browsing and grazing by herbivores	Restore browsing/grazing (e.g. by livestock) to sufficient levels to allow tree seedlings and saplings the opportunity to exceed browse height, and which will restore the characteristic structure of the H9130 woodland feature	Herbivores, especially deer, are an integral part of woodland ecosystems. They are important in influencing woodland regeneration, composition and structure and therefore in shaping woodland wildlife communities. In general, both light grazing and browsing is desirable to promote both a diverse woodland structure and continuous seedling establishment. Short periods with no grazing at all can allow fresh natural regeneration of trees, but a long-term absence of herbivores can result in excessively dense thickets of young trees which shade out ground flora and lower plant species. However, heavy grazing by deer or sheep prevents woodland regeneration, and can cause excessive trampling and/or poaching damage, canopy fragmentation, heavy browsing, bark-stripping and a heavily grazed sward. Some section of the English woodland are experiencing excessive deer pressure, resulting in unfavourable condition. The English side of lower Wye valley now has a substantial population of feral wild boar. The aim is to keep the population capped at 1000 animals within the Wye Valley and Forest of Dean, but their breeding is prolific and year round and control is tricky. At moderate population density boar may benefit woodland ecology through their rooting feeding behaviour by increasing species richness through seed dispersal and disturbance. However, at high density they may negatively impact woodland vegetation and ground nesting fauna (Massei & Genov 2004).	NATURAL ENGLAND
Structure and function (including its	**Regeneration potential**	Restore the potential for sufficient natural regeneration of desirable trees and shrub species	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	NATURAL ENGLAND, (2015). NATURAL ENGLAND

Table 1: Supplementary Advice for Qualifying Features: H9130. Asperulo-Fagetum beech forests; Beech forests on neutral to rich soils

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
typical species)			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. Typically, tree seedlings of desirable species (measured by seedlings and <1.3m saplings - above grazing and browsing height) should be visible at sufficient density to maintain canopy density over a 10 year period e.g. 20 saplings in a 50 x 50m block (or equivalent regrowth from coppice stumps). High levels of deer browsing are negatively impacting regeneration on some units resulting in unfavourable condition.	NATURAL RESOURCES WALES (2008) WILKINSON , K. (2013a)
	Vegetation structure -	Restore an understorey of native shrub cover of between 10 - 40% 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. Currently high deer pressure is resulting in unfavourable condition in some units.	NATURAL ENGLAND NATURAL RESOURCES WALES (2008)
Structure and function (including its typical species)	**Tree and shrub species composition**	Maintain a canopy and under-storey which is dominated by beech and other site-native trees and shrubs for example: Ash, Birch, Holly, Hornbeam, Lime Oak, Whitebeam, Willow Wych elm,Yew	Native trees and shrubs in general support a greater diversity of associated species than non-native species, especially amongst groups of invertebrates which depend directly on trees for food and shelter. There are many plants and animals which use or co-exist with non-native trees, but many rare and threatened woodland species are specialists adapted to one or a few native trees or shrub species (birches, willows and oaks, are examples of trees that host many specialist insect species). Sycamore and sweet chestnut is tolerated as a naturalised component at low density on those SSSIs in which they were present at designation. Due to the nature of sycamore, in particular, it may require control to maintain it at sufficiently low density. Natural England/Natural Resources Wales will advise on this on a case-by-case basis.	NATURAL ENGLAND; NATURAL RESOURCES WALES (2008)

Table 1: Supplementary Advice for Qualifying Features: H9130. Asperulo-Fagetum beech forests; Beech forests on neutral to rich soils

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			Whilst it is appropriate for beech to be the most prominent tree across this feature, a diversity of native tree and scrub species is to be encouraged both to support the associated fauna and flora and to retain resilience from the threat of tree diseases.	
Structure and function (including its typical species)	**Key structural, influential or distinctive species: flora and fauna**	Maintain and restore the abundance of the species listed below to enable each of them to be a viable component of the H9130 Annex 1 habitat; Structural Beech *Fagus sylvatica* Ash *Fraxinus excelsior,* Oak *species Quercus spp.,* Yew *Taxus baccata,* Whitebeam *species Sorbus spp.,* Wild Cherry *Prunus avium* and Silver Birch *Betula pendula.* Distinctive Wood Stitchwort *Stellaria nemorum subsp. Montana* Maidenhair Spleenwort *Asplenium trichomanes subsp. Pachyrachis,* Yellow Bird's-nest *Monotropa hypopytis* Assemblage of rare/scarce woodland plants including Wood Barley *Hordelymus europaeus,* Large Leaved Lime *Tilia platyphyllos,* Narrow-leaved Bitter-cress *Cardamine impatiens,*	Some plant or animal species (or related groups of such species) make a particularly important contribution to the necessary structure, function and/or quality of an Annex I habitat feature at a particular site. These species will include; • *Structural* species which form a key part of the Annex I habitat's structure or help to define that habitat on a particular SAC (see also the attribute for 'vegetation community composition'). • *Influential* species which are likely to have a key role affecting the structure and function of the habitat (such as bioturbators (mixers of soil/sediment), grazers, surface borers, predators or other species with a significant functional role linked to the habitat) • *Site-distinctive* species which are considered to be a particularly special and distinguishing component of an Annex I habitat on a particular SAC. There may be natural fluctuations in the frequency and cover of each of these species. The relative contribution made by them to the overall ecological integrity of a site may vary, and Natural 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.	NATURAL ENGLAND NATURAL RESOURCES WALES (2008)

Table 1: Supplementary Advice for Qualifying Features: H9130. Asperulo-Fagetum beech forests; Beech forests on neutral to rich soils

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		Stinking Hellebore *Helleborus foetidus and* Wood Fescue *Festuca altissima.* Narrow-leaved Helleborine *Cephalanthera longifolia* Assemblage of rare/scarce plants of limestone rocks, pavement and cliffs including soft-leaved Sedge *Carex montana,* *Carex humilis,* Fingered Sedge *Carex digitata,* Round Leaved Whitebeam *Sorbus eminens,* English Whitebeam *Sorbus anglica,* a Whitebeam *Sorbus porrigentiformis,* Rock Whitebeam *Sorbus rupicola* (and *Sorbus* hybrids) Assemblage of woodland bryophytes including *Anomodon longifolius* Population of dormouse Greater Horseshoe Bat *Rhinolophus ferrumequinum* Assemblage of declining woodland bird populations include Hawfinch *Coccothraustes coccothraustes,* Marsh Tit *Poecile palustris,* Willow Tit *Poecile montanus,* Lesser Spotted Woodpecker *Dendrocopos minor,* Pied Flycatcher *Ficedula hypoleuca*		

Table 1: Supplementary Advice for Qualifying Features: H9130. Asperulo-Fagetum beech forests; Beech forests on neutral to rich soils

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		Wood White *Leptidea sinapis* Fungus *Boletus satanus*		
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 H9130 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. Invasive species currently requiring control in the Wye Valley Woodlands include rhododendrons, cherry laurel, holm oak, cotoneaster, sycamore, himalayan balsam, and muntjac deer.	NATURAL ENGLAND WILKINSON , K. (2013A)
	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 H9130 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.	
	Root zones of ancient trees	Maintain the soil structure within and around the root zones of the mature and ancient tree cohort in an un-compacted condition	Ancient trees are **t**hose which have reached a great age and are typically characterized by a wide hollowed trunk and a short low stature due to a reduced crown size. The management of land within and around forest habitats which are characterised by ancient trees can be crucial to their individual welfare and long-term continuity, and the landscape they are part of can be just as or even more important. The condition of the soil surrounding such trees will affect their roots,	NATURAL ENGLAND. GPS data layer for *Sorbus* trees on The Doward FORESTRY COMMISSION. Trees of

Table 1: Supplementary Advice for Qualifying Features: H9130. Asperulo-Fagetum beech forests; Beech forests on neutral to rich soils

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			associated mycorrhizal fungi and growth. Plants have difficulty in compacted soil because the mineral grains are pressed together, leaving little space for air and water which are essential for root growth. Unless carefully managed, activities such as construction, forestry management and trampling by grazing livestock and human feet during recreational activity may all contribute to excessive soil compaction around ancient trees.	note GIS layer for the Forest of Dean district Woodland ancient tree survey of the Dean and part of Wye Valley (part of HLF Foresters' Forest program)
Structure and function (including its typical species)	**Adaptation and resilience**	Restore the H9130 feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site	This recognises the increasing likelihood of natural habitat features to absorb or adapt to wider environmental changes. Resilience may be described as the ability of an ecological system to cope with, and adapt to environmental stress and change whilst retaining the same basic structure and ways of functioning. Such environmental changes may include changes in sea levels, precipitation and temperature for example, which are likely to affect the extent, distribution, composition and functioning of a feature within a site. The vulnerability and response of features to such changes will vary. Using best available information, any necessary or likely adaptation or adjustment by the feature and its management in response to actual or expected climatic change should be allowed for, as far as practicable, in order to ensure the feature's long-term viability. The overall vulnerability of this particular SAC to climate change has been assessed by Natural England as being low, taking into account the sensitivity, fragmentation, topography and management of its habitats. These sites are considered to be vulnerable overall but are a lower priority for further assessment and action. Individual species may be more or less vulnerable than their supporting habitat itself. In many cases, change will be inevitable so appropriate monitoring would be required.	NATURAL ENGLAND, 2015b.
Supporting processes	**Air quality**	Restore the concentrations and deposition of air pollutants to within the site-relevant Critical	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,	More information about site-relevant Critical Loads and Levels for this

Table 1: Supplementary Advice for Qualifying Features: H9130. Asperulo-Fagetum beech forests; Beech forests on neutral to rich soils

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
(on which the feature relies)		Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	altering its vegetation structure and composition and causing the loss of sensitive typical species associated with it. Critical Loads and Levels are recognised thresholds below which such harmful effects on sensitive UK habitats will not occur to a significant level, according to current levels of scientific understanding. There are critical levels for ammonia (NH3), oxides of nitrogen (NOx) and sulphur dioxide (SO2), and critical loads for nutrient nitrogen deposition and acid deposition. There are currently no critical loads or levels for other pollutants such as Halogens, Heavy Metals, POPs, VOCs or Dusts. These should be considered as appropriate on a case-by-case basis. Ground level ozone is regionally important as a toxic air pollutant but flux-based critical levels for the protection of semi-natural habitats are still under development. It is recognised that achieving this target may be subject to the development, availability and effectiveness of abatement technology and measures to tackle diffuse air pollution, within realistic timescales. Nitrogen deposition currently exceeds critical loads for the features in this SAC, hence the restoration objective.	SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk). NATURAL ENGLAND, (2015).
	Hydrology	At a site, unit and/or catchment level (as necessary, maintain natural hydrological processes to provide the conditions necessary to sustain the H9130 feature within the site	Defining and maintaining the appropriate hydrological regime is a key step in moving towards achieving the conservation objectives for this site and sustaining this feature. Changes in source, depth, duration, frequency, magnitude and timing of water supply can have significant implications for the assemblage of characteristic plants and animals present. Hydrology particularly important for tufa springs (Upper Wye Gorge and Shorncliff). Bryophyte assemblage at Cleddon. Killarney fern at Cleddon.	
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	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	

Table 1: Supplementary Advice for Qualifying Features: H9130. Asperulo-Fagetum beech forests; Beech forests on neutral to rich soils

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		H9130 feature and its typical species at this site.	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. Maintained (no light issues mentioned in condition assessments, any planning should be assessed particularly in relation to bats)	
	Conservation measures	Maintain and implement the management measures (either within or outside the site boundary) which are necessary to maintain the structure, functions and supporting processes associated with the H9130 feature	Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site. Further details about the necessary conservation measures for this site can be provided by contacting Natural England. This information will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, Site Management Strategies or Plans, the Views about Management Statement for the underpinning SSSI and/or management agreements.	NATURAL ENGLAND, (2015). ENGLISH NATURE, 2005. NATURAL RESOURCES WALES (2008)
Version Control Advice last updated: 19/02/2019; additional text added regarding the presence of feral wild boar.				
Variations from national feature-framework of integrity-guidance: Structure and Function – community composition – agreed with NRW to remove to introductory section explaining the complexities of NVC in this SAC Invasive species category added Vegetation shrub layer added Structure and function (including its typical species) - agreed with NRW to remove as unnecessary – explain NVC structure of Annex 1 habitats in introductory section Structure and function (including its typical species) - no sites have graduated edge, not possible in some areas of gorge, probably not a priority for this site Wood pasture targets combined with the beech woodland targets to reduce repetition.				

Table 2: Supplementary Advice for Qualifying Features: H91J0. *Taxus baccata* woods of the British Isles; Yew-dominated woodland *

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Extent and distribution of the feature	**Extent of the feature within the site**	Restore the total extent of the H91J0 feature. This is currently recorded at 20.36 Ha	See notes for this attribute in Table 1 above. Target is restoration as there may be an opportunity to expand area in Lower Wye Gorge where larch is felled, is in 9180 - Tilio-Acerion forests but significant proportion of yew understory and ash dieback may prevent ash regeneration. Some areas of yew woodland are on small outcrops and too small to map but are still an important part of the habitat. W12c *Taxus baccata* sub community is not classed as Annex 1 yew habitat (rather is part of beech woodland) but is a significant component of the yew woodland, providing links between W13 habitat	WILKINSON, K. (2013B)
	Spatial distribution of the feature within the site	Restore the distribution and configuration of the H91J0 feature, including where applicable its component vegetation types, across the site	See notes for this attribute in Table 1 above. Do not want to lose the distribution of core areas across the SAC, but there can be some natural flexibility over wider distribution. With Ash dieback there will inevitably be some change. Currently all areas of W13 are in Welsh sites; there is no W13 in English sites though restoration may be possible in some areas e.g. at Upper Wye Gorge hence the target is set to restore.	NATURAL ENGLAND & NRW NATURAL RESOURCES WALES (2008)
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 (s) W13	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).	

Table 2: Supplementary Advice for Qualifying Features: H91J0. *Taxus baccata* woods of the British Isles; Yew-dominated woodland *

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Structure and function (including its typical species)	**Vegetation structure - canopy cover**	Maintain an appropriate tree canopy cover across the feature, which will typically be between 40-90% of the site	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, litter-fall, 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 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.	WILKINSON, K. (2013B) NATURAL RESOURCES WALES (2008)
	Vegetation structure - old growth	Maintain the extent and continuity of undisturbed, mature/old growth stands (typically comprising at least 50% of the feature at any one time) and the assemblages of veteran and ancient trees (typically >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. 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. There are a number of veteran yew trees scattered across the SAC though not necessarily within the W13 classification.	WILKINSON, K. (2013B)
	Vegetation structure - dead wood	Maintain the continuity and abundance of standing or fallen dead and decaying	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 what the most appropriate structure is for the woodland feature on a particular site, taking account of its known interest, history, past management and the landscape context.	WILKINSON, K. (2013B)

Table 2: Supplementary Advice for Qualifying Features: H91J0. *Taxus baccata* woods of the British Isles; Yew-dominated woodland *

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		wood at a minimum of 3 fallen trees >30cm and 4 standing trees >10cm diameter per ha.	Dead and actively decaying wood, either as part of a standing tree or as a fallen tree on the woodland floor, is an important component of woodland ecosystems, and supports a range of specialist invertebrates, fungi, lichens and bryophytes, and associated hole-nesting birds and roosting bats, all of which may be very typical of the feature. Due to the historic coppice management and lack of ancient trees, the target is set slightly lower than it might be on other SACs. However, the long term aim should be to increase the number of veteran trees and dead wood.	
Structure and function (including its typical species)	**Vegetation structure - age class distribution**	Maintain at least 2 age classes (eg pole stage, mature, veteran) spread across the average life expectancy of the trees - which can be hundreds of years.	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.	WILKINSON, K. (2013B)
	Vegetation structure - shrub layer	Maintain a sparse understorey of native shrubs under the yew canopy, with species such as holly, hawthorn, elder or box occasionally present.	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. This will vary with light levels and site objectives. Within a 50 x 50m area, at least 50% of the ground is bare or covered in dead yew needles	WILKINSON, K. (2013B)
	Adaptation and resilience	Maintain the feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either	This recognises the increasing likelihood of natural habitat features needing to absorb or adapt to wider environmental changes. Resilience may be described as the ability of an ecological system to cope with, and adapt to environmental stress and change whilst retaining the same basic structure and ways of functioning. Such environmental changes may include changes in sea levels, precipitation and temperature for example, which are likely to affect the extent, distribution, composition and functioning of a feature within a site. The vulnerability and response of features to such changes will vary.	NATURAL ENGLAND, 2015b. BROADMEADOW, MSJ. *et al*, 2005,

Table 2: Supplementary Advice for Qualifying Features: H91J0. *Taxus baccata* woods of the British Isles; Yew-dominated woodland *

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		within or external to the site Restore the resilience of the feature by ensuring a diversity of site-native tree species; although yew dominates, this can be provided by a scattering of one or more of whitebeam, ash, beech and oak. Sycamore is acceptable at low density in those units in which it was present at designation.	Using best available information, any necessary or likely adaptation or adjustment by the feature and its management in response to actual or expected climatic change should be allowed for, as far as practicable, in order to ensure the feature's long-term viability. The overall vulnerability of this particular SAC to climate change has been assessed by Natural England as being **low**, taking into account the sensitivity, fragmentation, topography and management of its habitats. These sites are considered to be vulnerable overall but are a lower priority for further assessment and action. Individual species may be more or less vulnerable than their supporting habitat itself. In many cases, change will be inevitable so appropriate monitoring would be required.	
Structure and function (including its typical species)	**Regeneration potential**	Maintain the potential for sufficient natural regeneration of desirable trees and shrubs;	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. Typically tree seedlings of desirable species (measured by seedlings and <1.3m saplings - above grazing and browsing height) should be visible at sufficient density to maintain canopy density over a 10 yr period (or equivalent regrowth from coppice stumps). Minimum of 30 viable *Taxus baccat*a seedlings within two 25x25m squares adjacent to the assessment area.	WILKINSON, K. (2013B) NATURAL RESOURCES WALES (2008)

Table 2: Supplementary Advice for Qualifying Features: H91J0. *Taxus baccata* woods of the British Isles; Yew-dominated woodland *

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
	Tree and shrub species composition	Maintain a canopy and under-storey dominated by yew with other site native trees and shrubs e.g. Beech, Lime, Ash, Hazel Holly	Native trees and shrubs in general support a greater diversity of associated species than non-native species, especially amongst groups of invertebrates which depend directly on trees for food and shelter. There are many plants and animals which use or co-exist with non-native trees, but many rare and threatened woodland species are specialists adapted to one or a few native trees or shrub species (birches, willows and oaks, are examples of trees that host many specialist insect species).	NATURAL RESOURCES WALES (2008)
Structure and function (including its typical species)	**Key structural, influential and distinctive species**	Maintain and Restore the abundance of the species listed below to enable each of them to be a viable component of the Annex 1 habitat; Structural Yew *Taxus baccata* Small Leaved Lime *Tilia cordata,* Ash *Fraxinus excelsior,* Beech *Fagus sylvatica*, Pendunculate oak *Quercus robur* or Common Whitebeam *Sorbus aria.* Distinctive Rare lichen *Porina rosei* Southern Polypody *Polypodium*	See notes for this attribute in Table 1 above.	

Table 2: Supplementary Advice for Qualifying Features: H91J0. *Taxus baccata* woods of the British Isles; Yew-dominated woodland *

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		cambricum, Maidenhair Spleenwort sp. *Asplenium trichomanes subsp. Pachyrachis,* Whitebeam species *Sorbus Spp.*		
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 H91J0 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 (eg 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. Grey squirrel are damaging yew coppice regrowth by bark stripping.	WILKINSON, K. (2013B) NATURAL RESOURCES WALES (2008)
	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.	

Table 2: Supplementary Advice for Qualifying Features: H91J0. *Taxus baccata* woods of the British Isles; Yew-dominated woodland *

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
	Root zones of ancient trees	Maintain the soil structure within and around the root zones of the over-mature and ancient tree cohort in an un-compacted condition	Ancient trees are those which have reached a great age. They are typically characterized by a wide hollowed trunk and a short low stature due to a reduced crown size. The management of land within and around forest habitats which are characterised by ancient trees can be crucial to their individual welfare and long-term continuity, and the landscape they are part of can be just as or even more important. The condition of the soil surrounding such trees will affect their roots, associated mycorrhizal fungi and growth. Plants have difficulty in compacted soil because the mineral grains are pressed together, leaving little space for air and water which are essential for root growth. Unless carefully managed, activities such as construction, forestry management and trampling by grazing livestock and human feet during recreational activity may all contribute to excessive soil compaction around ancient trees.	
Supporting processes (on which the feature relies)	**Functional connectivity with wider landscape**	Restore the overall extent, quality and function of any supporting features within the local landscape which provide a critical functional connection with the H91J0 feature	See notes for this attribute in Table 1 above.	
	Air quality	Restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	See notes for this attribute in Table 1 above. .	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). NATURAL ENGLAND, (2015b).

Table 2: Supplementary Advice for Qualifying Features: H91J0. *Taxus baccata* woods of the British Isles; Yew-dominated woodland *

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
	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.	
	Conservation measures	Maintain and implement the management measures (either within or outside the site boundary) which are necessary to maintain the structure, functions and supporting processes associated with the H91J0 feature	Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site. Further details about the necessary conservation measures for this site can be provided by contacting Natural England. This information will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, Site Management Strategies or Plans, the Views about Management Statement for the underpinning SSSI and/or management agreements.	NATURAL ENGLAND, (2015b). NATURAL RESOURCES WALES (2008)
Version Control Advice last updated: n/a				
Variations from national feature-framework of integrity-guidance: Attribute 'Vegetation structure open space' removed from table as this woodland type only exists as small patches within much larger expanse of woodland. Open space within this habitat not necessary Attribute of Root zones of ancient trees added in Attributes for "supporting off site habitat" and "Functional connectivity within wider landscape" merged				

Table 3: 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**	Restore the total extent of the H9180 feature extent to 454.4 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. For example, the restoration of the area of larch plantation in Lower Wye Gorge which is within an area of 9180 - Tilio-Acerion. Under natural regeneration, however, the regenerative habitat type is uncertain as ash dieback may prevent ash regeneration. See notes for this attribute in table 1 above.	NATURAL ENGLAND & NRW NATURAL ENGLAND WILKINSON, K. (2013C)
	Spatial distribution of the feature within the site	Maintain the distribution and configuration of the H9180 feature, including where applicable its component vegetation types, across the site	See notes for this attribute in table 1 above. Do not want to lose the distribution of core areas across the SAC, but there can be some natural flexibility over wider distribution. With ash dieback there will inevitably be some change.	NATURAL RESOURCES WALES (2008)
Structure and function (including its typical species)	**Vegetation structure - canopy cover**	Restore an appropriate tree canopy cover across the H9180 feature, which will typically be between 60-90% of the site on the steeper minimum intervention areas and 30-90% elsewhere across the sites.	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, litter-fall, 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 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.	NATURAL ENGLAND WILKINSON, K. (2013C)

Table 3: 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)
			Although this SAC has allowance in the target for a denser canopy due to the nature of ravine woodland being harder to manage, the condition assessments show that the density of the canopy is preventing regeneration in some units, therefore the target is to restore.	
Structure and function (including its typical species)	**Vegetation structure - open space**	Restore areas of permanent and temporary open space within the woodland feature, typically to cover a minimum of 10% of the whole SAC area at any one time.	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 what the most appropriate structure is 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. Target set to restore, as a lack of open space means some units are currently unfavourable, others might be assessed as favourable but with open space as borderline.	NATURAL ENGLAND NATURAL RESOURCES WALES (2008) WILKINSON, K. (2013C)
	Vegetation structure - old growth	Restore the extent and continuity of undisturbed, mature/old growth stands and the assemblages of veteran and ancient trees .	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. 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. Due to the steep nature of the gorge woodland and the historic coppicing of much of the woodland, there are only a few scattered veteran or ancient trees. In this case management is targeted at identifying and developing future veterans and	NATURAL ENGLAND NATURAL RESOURCES WALES (2008)

Table 3: 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)
			assigning minimum intervention areas which will allow mature/over mature woodland to develop. Some areas of relatively undisturbed mature/old growth stands or a scatter of large trees allowed to grow to overmaturity/death on site (e.g. a minimum of 10% of the woodland or 5-10 trees per ha). Areas of Upper Wye Gorge, Highbury, Lower Wye Gorge, Caswell Woods and The Hudnalls are minimal intervention	
Structure and function (including its typical species)	**Vegetation structure - dead wood**	Restore the continuity and abundance of standing or fallen dead and decaying wood at a minimum of 3 fallen trees >30cm and 4 standing trees >10cm diameter per ha.	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 what the most appropriate structure is for the woodland feature on a particular site, taking account of its known interest, history, past management and the landscape context. Due to the historic coppice management and lack of ancient trees, the target is set slightly lower than it might be on other SACs. However, the long term aim should be to increase the number of veteran trees and dead wood.	NATURAL ENGLAND NATURAL RESOURCES WALES (2008) WILKINSON, K. (2013C)
	Vegetation structure - age class distribution	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. In the shorter term in some units it is acceptable for the age class structure to be less than three due to historic management but in the long term, management should encourage the three class age structure to develop. Deer browsing in some areas is also limiting regeneration and therefore the quantity of the lowest age class.	NATURAL ENGLAND NATURAL RESOURCES WALES (2008) WILKINSON, K. (2013C)
	Vegetation structure - shrub layer	Restore an understorey of shrub cover at between 20 - 40% of the stand 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. Too much deer browsing is causing some SSSIs to fail condition assessments.	NATURAL RESOURCES WALES (2008) WILKINSON, K. (2013C)
	Vegetation structure -	Restore a graduated woodland edge into	Woodland edge is defined as being the transitional zone between the forest feature and adjacent but different habitat types - the best woodland edges will	

Table 3: 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)
	woodland edge	adjacent semi-natural open habitats, other woodland/wood-pasture types or scrub.	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-chemicals could potentially not allow this gradation of woodland edge and could have other impacts on the integrity of the site. Although some areas of the gorge woodlands do not have scope for graduated edge due to the topography, some areas such as Highbury would benefit from restoration of a more graduated edge.	
Structure and function (including its typical species)	**Adaptation and resilience**	Restore the resilience of the feature by ensuring a diversity of site-native trees (at least 4 site native tree species) eg ash/ small-leaved lime/ aspen/ alder/ rowan/ bird cherry/ birch) is present across the site.	See the explanatory notes for this attribute above.	NATURAL ENGLAND WILKINSON, K. (2013C) NATURAL ENGLAND, (2015b). BROADMEADOW, MSJ. et al, 2005,
	Browsing and grazing	Restore browsing at a (low) level indicated by a well-developed understorey with no obvious browse line, lush ground vegetation with some grazing-sensitive species evident and tree seedlings and sapling common in gaps.	Herbivores, especially deer, are an integral part of woodland ecosystems. They are important in influencing woodland regeneration, composition and structure and therefore in shaping woodland wildlife communities. In general, both light grazing and browsing is desirable to promote both a diverse woodland structure and continuous seedling establishment. Short periods with no grazing at all can allow fresh natural regeneration of trees, but a long-term absence of herbivores can result in excessively dense thickets of young trees which shade out ground flora and lower plant species. However, heavy grazing by deer or sheep prevents woodland regeneration, and can cause excessive trampling and/or poaching damage, canopy fragmentation, heavy browsing, bark-stripping and a heavily grazed sward.	NATURAL ENGLAND

Table 3: 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)
			Some sections of the English woodland are currently experiencing excessive deer pressure, resulting in unfavourable condition. The English side of lower wye valley now has a substantial population of feral wild boar. The aim is to keep the population capped at 1000 animals within the Wye Valley and Forest of Dean, but their breeding is prolific and year round and control is tricky. At moderate population density boar may benefit woodland ecology through their rooting feeding behaviour by increasing species richness through seed dispersal and disturbance. However, at high density they may negatively impact plants and ground nesting fauna (Massei & Genov 2004).	
Structure and function (including its typical species)	**Regeneration potential**	Restore the potential for sufficient natural regeneration of desirable trees and shrubs	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. Typically, tree seedlings of desirable species (measured by seedlings and <1.3m saplings - above grazing and browsing height) should be at sufficient density to maintain canopy density over a 10 yr period e.g. 20 saplings in a 50 x 50m block (or equivalent regrowth from coppice stumps). High levels of deer browsing are negatively impacting regeneration on some units resulting in unfavourable condition.	NATURAL ENGLAND WILKINSON, K. (2013C)
	Key structural, influential and distinctive species: flora and fauna	Maintain the abundance of the typical species listed below to enable each of them to be a viable component of the H9180 habitat; Structural	See notes for this attribute above.	NATURAL ENGLAND SSSI Citations NATURAL RESOURCES WALES SSSI citations NATURAL ENGLAND NATURAL RESOURCES WALES (2008)

Table 3: 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)
		Ash *Fraxinus excelsior,* Small Leaved Lime *Tilia Cordata* Distinctive Wood Stitchwort *Stellaria nemorum subsp. Montana* Maidenhair Spleenwort *Asplenium trichomanes subsp. Pachyrachis,* Upright Spurge *Euphorbia stricta*, Lily-of-the-Valley *Convallaria majalis*, Southern Polypody *Polypodium cambricum*, Mountain Melick *Melica nutans.* Assemblage of rare/scarce plants of limestone rocks, pavement and cliffs including Soft-leaved Sedge *Carex montana, Carex humilis,* Fingered Sedge *Carex digitata,*		

Table 3: 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)
		Round Leaved Whitebeam *Sorbus eminens,* English Whitebeam *Sorbus anglica,* a Whitebeam *Sorbus porrigentiformis,* Rock Whitebeam *Sorbus rupicola* Doward Whitebeam *S. eminentiformis*, (and *Sorbus* hybrids) Assemblage of woodland bryophytes including *Anomodon longifolius* Dormouse *Muscardinus avellanarius* Greater Horseshoe Bat *Rhinolophus ferrumequinum* Pauper Pug moth *Eupithecia egenaria,* Scarce Hook-tip moth *Sabra harpagula* a Pyralid moth sp.*Salebriopsis albicilla,* Scarce Lime Bark Beetle *Ernoporus tiliae*		

Table 3: 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)
		Assemblage of declining woodland birds include Hawfinch *Coccothraustes coccothraustes,* Marsh Tit *Poecile palustris,* Willow Tit *Poecile montanus,* Lesser Spotted Woodpecker *Dendrocopos minor,* Pied Flycatcher *Ficedula hypoleuca and* Goshawk		
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 H9180 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 (eg 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. Cotoneaster and holm oak are a particular problem at Lower Wye gorge where they descend the cliff from the gardens above. Himalayan balsam is creeping up from the River banks into areas of the Hudnalls, perrywinkle is a problem in Piercefield woods while Epilobium is at 365 steps (Blackcliff-Windcliff SSSI). Sycamore, rhododendron and cherry laurel are found scattered throughout the SAC and require removal when found. Muntjac deer could also be considered an invasive species.	NATURAL ENGLAND WILKINSON, K. (2013C) NATURAL ENGLAND, (2015b).

Table 3: 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)
			A particular threat is the presence of ash dieback caused by *Hymenoscyphus fraxineus* which is considered to be a significant threat to this habitat.	
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**	Restore the overall extent, quality and function of any supporting features within the local landscape which provide a critical functional connection with the site.	See notes for this attribute in Table 1 above.	
	Air quality	Restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	See notes for this attribute in table 1 above.	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). NATURAL ENGLAND, (2015b).

Table 3: 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)
Supporting processes (on which the feature relies)	**Hydrology**	At a site, unit and/or catchment level (as necessary), maintain natural hydrological processes to provide the conditions necessary to sustain the feature within the site	Defining and maintaining the appropriate hydrological regime is a key step in moving towards achieving the conservation objectives for this site and sustaining this feature. Changes in source, depth, duration, frequency, magnitude and timing of water supply can have significant implications for the assemblage of characteristic plants and animals present. Disruption/ damage to hydrological processes could be caused by activities at some distance from the site boundary. Hydrology is particularly important for tufa springs (Upper Wye Gorge and Shorncliff). Bryophyte assemblage at Cleddon. Killarney fern at Cleddon. Humid seepages, spring lines and streams within the Tilio-Acerion woodlands (in particular those found at Cleddon Shoots Woods SSSI, Graig Wood SSSI & Martridge Wood within Blackcliff/Wyndcliff SSSI and Shorncliff & Casswell Woods SSSI) will support a range of Atlantic bryophytes that are near their south-eastern limit in the UK. Natural flow rates and humidity levels should be maintained and sufficient canopy cover retained to maintain local humidity and deadwood left in situ. These areas should be 'minimal intervention areas' with local buffers that ensure they are not disturbed and tree cover is not removed. (Where non-native species require removal it may be acceptable to remove some tree cover).	
	Illumination	Ensure artificial light is maintained to a level which is unlikely to affect natural phenological cycles and processes to the detriment of the feature and its typical species at this site.	Woodland biodiversity has naturally evolved with natural patterns of light and darkness, so disturbance or modification of those patterns can influence numerous aspects of plant and animal behaviour. For example, light pollution (from direct glare, chronically increased illumination and/or temporary, unexpected fluctuations in lighting) can affect animal navigation, competitive interactions, predator-prey relations, and animal physiology. Flowering and development of trees and plants can also be modified by un-natural illumination which can disrupt natural seasonal responses.	
Version Control Advice last updated: 19/02/19 – references to wild boar and ash dieback added.				
Variations from national feature-framework of integrity-guidance: Structure and Function – community composition – agreed with NRW to remove into introductory section explaining the complexities of NVC in this SAC Structure and function (including its typical species) - no sites have graduated edge, not possible in some areas of gorge, probably not a priority for this site so agree with NRW as not applicable.				

Table 4: Supplementary Advice for Qualifying Features: S1303. *Rhinolophus hipposideros*; Lesser horseshoe bat

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Supporting processes (on which the feature and/or its supporting habitat relies)	**Conservation measures**	Maintain or restore the management measures (either within and/or outside the site boundary as appropriate) which are necessary to maintain and restore the structure, functions and supporting processes associated with the feature and/or its supporting habitats.	Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site. Further details about the necessary conservation measures for this site can be provided by contacting Natural England/Natural Resources Wales. 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. Management for this site includes maintaining grills to hibernation entrances, maintaining and restoring flight-lines and feeding grounds within and connecting to the SAC, protecting swarming sites and flight-lines to swarming sites.	NATURAL ENGLAND, (2015b). DAVIDSON, S.P. AND THOMAS, R.J., 2017, NATURAL RESOURCES WALES (2008)
Supporting habitat: extent and distribution	**Extent of supporting habitat within the SAC**	Maintain the total extent of the habitat(s) which support the feature: total SAC woodland and associated open space (SAC area 916.24 Ha)	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. The bats require access to the hibernacula present in the Wye Valley Woodlands SAC meaning that they need to be able to cross to the site from the surrounding areas using suitable flight-lines within the SAC. They also need to be able to emerge and feed periodically during the hibernation period. A viable population also requires habitat conducive to swarming during the autumn, one of which has been recorded taking place within the SAC, and flight-lines to access maternity roosts which are in buildings close to the SAC.	GLOUCESTERSHIRE AND MONMOUTHSHIRE BAT GROUP survey data FORESTERS' FOREST BATSCAPE PROJECT https://www.forestersforest.uk/projects/15/batscape DAVIDSON, S.P. AND THOMAS, R.J., 2017,
Supporting processes (on which the feature and/or	**Adaptation and resilience**	Maintain the feature's ability, and that of its supporting habitat, to adapt or evolve to wider	See notes for this attribute above in table 1.	NATURAL ENGLAND, (2015b).

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
its supporting habitat relies)		environmental change, either within or external to the site	For this feature, the aim is to provide a range of undisturbed caves that will allow the correct hibernation conditions to be found in light of possible temperature changes due to climate change.	SHERWIN, MONTGOMERY, & LUNDY, (2012).
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).	The supporting habitats of this feature 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 (including food-plants) and reducing supporting habitat quality and population viability of this feature. See also the notes for this attribute in Table 1 above.	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). NATURAL ENGLAND, (2015b).
Supporting habitat: structure/ function	**Internal condition of underground hibernation sites**	Maintain the structural integrity of the roost space, with stable, cool and dark conditions, and no recent collapses/falls or signs of geological instability.	Damp, draught and increases in light levels are likely to have a negative effect on the temperature, humidity and suitability of the roost.	Underground bat surveys carried out by FoDCCAG (English Sites) WILKINSON, K. (2013d)
	Access to underground hibernation sites	Maintain the number of access points to the roost at an optimal size and in an unlit and unobstructed state, with surrounding vegetation providing sheltered flyways without obstructing access).	This 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; lesser horseshoes 300 x 200mm No artificial lights shining on the entrance. Maintain with appropriate reference to lighting conditions and anti-predator measures.	Underground bat surveys carried out by FoDCCAG (English Sites) WILKINSON, K. (2013D) NATURAL ENGLAND, (2015b). SCHOFIELD (2008).
	Supporting off-site habitat (flight-lines and	Restore the presence, structure and quality of any linear landscape features which function as flight-lines between	Roost choice, and the presence of bats within the SAC, is likely to be influenced by the site's ability to provide bats with food and shelter. Key feeding areas around a roost, and the commuting routes (or flight-lines)	FORESTERS' FOREST BATSCAPE PROJECT

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
	foraging areas)	the SAC and surrounding foraging areas used by lesser horseshoe bats. Maintain any core areas of feeding habitat outside of the SAC boundary that are critical to Lesser Horseshoe bats during their hibernation period	between them, will be an important element of sustaining the SAC population. Lesser horseshoes tend to forage within 2.5km of their summer roost, though they can travel up to 4km from these roosts to suitable foraging grounds (Schofield, 2008). Within the winter, their foraging range is reduced, with a mean foraging radius of 1.2 km around hibernation sites reported. Lesser horseshoes commute and forage along linear features over wet grassland and woodland. Permanent pasture and ancient woodland linked with an abundance of tall bushy hedgerows is ideal supporting habitat for this species. Flight-lines should remain as unlit, dark corridors. Flight-lines will extend beyond the designated site boundary into the wider local landscape. There are opportunities to improve the quality of hedgerows by gapping up or increasing hedgerow height and width where it is currently low. Road crossing opportunities may be increased by appropriate management of roadside trees. During the winter, lesser horseshoes emerge from hibernacula about once every two weeks for water / food, therefore condition of habitat in the immediate vicinity of hibernacula is very important. Winter prey (e.g. crane-flies, winter gnats, midges, dung flies) is often associated with damp woodland with decaying wood, and grazed pasture with abundant dung. Feeding areas used by SAC bats may be outside of the SAC boundary but be critical to successful hibernation (these undesignated areas are sometimes referred to as 'sustenance zones' or 'functionally-linked land').	WILLIAMS, C., SALTER, C & JONES, G. 2011, SCHOFIELD, H.W. 2008.
Supporting processes (on which the feature and/or its supporting habitat relies)	**Disturbance from human activity**	Control and minimise unauthorised public access to roost sites within the SAC	Site should be secured as necessary against unauthorised access, which can result in significant 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. Surveys of the SAC roosts should be undertaken by appropriately licensed members of Forest of Dean Cave Conservation and Access Group (FoDCCAG) under the joint protocol between FoDCCAG the Forestry Commission (Deputy Gaveller) and Natural England.	Underground bat surveys carried out by FoDCCAG (English Sites) WILKINSON, K. (2013D) NATURAL ENGLAND, (2015b).

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Population (of the feature)	**Population abundance - hibernation site**	Maintain the abundance of the hibernating Lesser horseshoe bat population at not less than 100 individual bats	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. 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. More specific target numbers have not been set for this SAC however, that may change in the future. 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/Natural Resources Wales staff can advise that the figures stated are the best available.	Underground bat surveys carried out by FoDCCAG (English Sites) WILKINSON, K. (2013d) NATURAL RESOURCES WALES (2008)

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			Develop an annual minimum recruitment, as well as a total annual population figure, target for this attribute. Monitoring of juvenile recruitment is often a more sensitive/early indicator of population change.	
Version Control Advice last updated: 19/02/2019 – reference added to the development of an annual population-recruitment target.				
Variations from national feature-framework of integrity-guidance: Supporting habitat: structure/function- Soils, substrate and nutrient cycling – this has been deleted as covered in the Annex 1 habitats Supporting processes (on which the feature and/or its supporting habitat relies-Water quantity/quality – this has been deleted as not relevant/covered in Annex 1 habitats Supporting habitat: structure/function- External condition of building - maternity colony –not applicable Supporting habitat: structure/function - External condition of building - hibernation site–not applicable Supporting habitat: structure/function cutInternal condition of building - maternity and hibernation –not applicable Population (of the feature) - Population abundance- maternity colony– delete, not applicable				

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