



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

Exmoor and Quantock Oakwoods Special Area of Conservation (SAC)
UK0030148



*Horner Wood - oak pollard in wood pasture in the Eastwater Valley.
North Exmoor SSSI/Dunkery & Horner Woods National Nature Reserve, Somerset.
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About this document

This document provides Natural England's supplementary advice about the European Site Conservation Objectives relating to Exmoor and Quantock Oakwoods SAC.

This advice should therefore be read together with the SAC Conservation Objectives available [here](#).

This site is contiguous along long boundaries with the Exmoor Heaths SAC so that you should also refer to the separate European Site Conservation Objectives and Supplementary Advice provided for those sites, which are available [here](#).

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

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

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

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

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

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

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

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

If you have any comments or queries about this Supplementary Advice document please contact your local Natural England adviser or email

HDIRConservationObjectivesNE@naturalengland.org.uk

About this site

European Site information

Name of European Site	Exmoor and Quantock Oakwoods Special Area of Conservation (SAC)
Location	Devon, Somerset
Site Map	The designated boundary of this site can be viewed here on the MAGIC website
Designation Date	1 April 2005
Qualifying features	See below
Designation Area	1894.05 ha
Designation Changes	None
Feature Condition Status	Details of the feature condition assessments made at this site can be found using Natural England's Designated Sites System
Names of component Sites of Special Scientific Interest (SSSIs)	West Exmoor Coast and Woods SSSI, Watersmeet SSSI, North Exmoor SSSI, Barle Valley SSSI, The Quantocks SSSI.
Relationship with other European or International Site designations	On Exmoor, the boundary of the SAC is contiguous with parts of the Exmoor Heaths SAC which can be seen here on the MAGIC website

Site background and geography

This site supports particularly large expanses of this habitat including some of the largest oak woods in southern England including Horner Wood and Watersmeet, which extend to nearly whole valley systems. The SAC has seven distinct blocks separated by semi-natural habitats or farmland and, in the case of the Quantocks, by the Taunton Vale. Most are located within Exmoor National Park, part of the Exmoor National Character Area ([NCA](#)). They include the Heddon Valley woods and Woody Bay in the far west of the National Park, the Watersmeet woodland complex above Lynton, Hawkcombe Woods and the extensive Horner Wood complex south of Porlock, and the Barle Valley woods below Withypool down to Dulverton. The Quantock outlier, within the Quantock Hills Area of Outstanding Natural Beauty, is represented by woodland extending up Holford and Hodder's Combes, together with Alfoxton and Shervage Woods.

The underlying Devonian sandstones and slates of the area underpin plateaux incised by fast flowing streams and rivers such as the Exe and Lyn, to form steep-sided valleys, 'combes'. They are rich in bryophytes, ferns and epiphytic lichens. The woodland is mainly ancient, semi-natural sessile oak woodland with rich lichen and bryophyte communities. The most widespread communities occurring are sessile oak - downy birch - *Dicranum majus* woodland on poorer, more lithomorphic soils on steeper slopes and sessile oak - downy birch - wood sorrel woodland on deeper soils developed on more moderate slopes towards the upper edge of the woods. Very small areas of deeper, wetter soils in the narrow floodplain may support richer stands of ash and alder. Large areas, especially on steep slopes, escaped Bronze Age clearances and later the replanting and coniferisation of the post 1600 modern era. In some places, there are long transitions to other semi-natural habitats, particularly heathland. Small areas of heaths, gorse and hawthorn scrub, acid grassland often with bracken, conifer or mixed woodland are included in the SAC. A small area at Woody Bay occurs on and above sea cliffs.

Much of the woodland will have been managed at some point in the last thousand years, but moving from a mainly pastoral landscape of medieval times into more intensive management within the last 200 years. Upland oak 'plantations' were common, woods that were clear-felled in the late 18th to early 19th century, and extensively planted up with oak for the purpose of producing oak coppice products (tan bark, charcoal and pit props). Many of these woods were coppiced on rotation, which resulted in a landscape covered in a patchwork of coppice coupes of different aged stands. As the coppicing industry declined in the 20th century, many of these coppice stools grew on to maturity. Today, many woodlands are characteristic of this sudden change in management, with a very even aged structure. Other areas represent remnants of the pastoral management and may be wood pasture in structure or open grown trees surrounded by younger stands. These areas have high ecological continuity and are critical to the survival of specialised lichens and other species.

The priority issue on the site is invasive species especially rhododendron and invasive knotweeds. Newer threats include *Montbretia Crocosmia crocosmifolia*, Himalayan balsam *Impatiens glandulifera* and fringecups *Tellima grandiflora* which are becoming recognised as problems locally and more widely. The wider catchment may be a source of new infestations for the SAC and so needs to be considered. Secondly, parts of the woodland lack a well-developed and open structure due to limited understorey development and/or an over-dominant canopy (lack of light and younger age classes) and locally an excessive abundance of beech. This is particularly a problem for areas rich in lichens of international importance. Thirdly, adaptation to climate change will be necessary, including to pests and diseases. Ash dieback (*Chalara*) is present locally on Exmoor and on the Quantocks. Ash trees are particularly valuable lichen hosts at younger ages than other species such as oak. Oak woodland on slightly richer soils with areas of mature ash, particularly along river valleys or derived from wood pasture, support the most important lichen communities of international importance. Dieback threatens this interest in the medium to long term and the future potential of the wood if whole generations of younger trees are affected. Additionally, nitrogen deposition exceeds site relevant critical loads and it is uncertain whether this is a major problem. Currently a sensitive feature, the lichen assemblage, appears to be in favourable condition for this particular factor. Currently grazing levels in woodlands are at generally acceptable levels because this type of woodland benefits from light to moderate grazing levels, providing more open conditions for woodland birds, lichens and dead wood invertebrates). Locally, studies suggest deer have greater impact than agricultural stock. In places heavy deer browsing can have a significant impact, preventing natural regeneration.

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:

- **H91A0. Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles.**

This site supports large expanses of this habitat including some of the largest oakwoods in southern England including Horner Wood and Watersmeet, forming whole valley systems. They are rich in bryophytes, ferns and epiphytic lichens. The most widespread communities occurring are W17 sessile oak - downy birch - *Dicranum majus* woodland (Rodwell, 1991) on poorer, more lithomorphic soils on steeper slopes and W11 sessile oak - downy birch - wood sorrel woodland on deeper soils developed on more moderate slopes towards the upper edge of the woods. W16b *Quercus* ssp - *Betula* spp - *Deschampsia flexuosa* woodland (*Vaccinium myrtillus* - *Dryopteris dilatata* sub-community) also occurs, particularly to the east.

It tends to be less bryophyte-rich than some of the western oakwood types, reflecting the fact that the Quantocks is towards the eastern edge of the range for this type. There are also areas of W10 *Quercus robur* – *Rubus fruticosus* – *Pteridium aquilinum*. The woods generally have rich Atlantic bryophyte/fern communities (Ratcliffe 1968), including species that are scarce on Exmoor such as the liverwort *Bazzania trilobata*, hay-scented buckler-fern *Dryopteris aemula* and Tunbridge filmy-fern *Hymenophyllum tunbrigense*. The rocky ravine areas of Watersmeet and the Barle woods have the most well developed bryophytes. Lichens are especially important, especially epiphytes including on old trees, often associated with old pollards or open-grown maiden trees, since parts are former wood-pasture rather than the oak coppice that is more common with this type. The combination of high humidity, and air quality, an open canopy which allows good illumination of epiphytes and the presence of relatively mature ash and oak standards favours the development of very diverse communities. Parts of the Exmoor series of woods are of international importance, including the Horner complex and the Barle.

The two major lichen associations well represented here are the Lobarion and *Lecanactidetum premneae*. These are communities of ancient woodland and many species which are particularly indicative of a long continuity of woodland cover are present for example: *Nephroma laevigatum*, *Peltigera collina*, *P. horizontalis*, *Sticta limbata*, *S. sylvatica*, *Thelotrema lepadinum*, *Cresponia premnea*, *Biatorina atropurpurea* and all four species of *Lobaria* which are to be found in Britain. The Lobarion association is best represented here on larger trees in the combe bottom and on old pollards where conditions are moist and not too shaded. The *Lecanactidetum premneae* is to be found on drier well-lit parts of trees often on the higher parts of the slopes. The Quantock woodlands are less surveyed but are probably important on a national scale for a range of old woodland and parkland species, principally on oak but also holly and ash. The coastal woodland at Woody Bay represents a transition to, and example of, Vegetated sea cliffs of the Atlantic and Baltic coasts under the Habitats Directive. The more coastal woods such as Woody Bay and Watersmeet hold important populations of rare and endemic whitebeam *Sorbus* species.

- **H91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)**

This habitat comprises woods dominated by alder *Alnus glutinosa* and willow *Salix* spp. along many streams in narrow flood plains in a range of situations from islands in river channels to low-lying wetlands alongside the channels. The habitat typically occurs on moderately base-rich, eutrophic soils subject to periodic inundation. Many such woods are dynamic, being part of a successional series of habitats. Their structure and function are best maintained within a larger unit that includes the open communities, mainly fen and swamp, of earlier successional stages. The main NVC equivalent W7 *Alnus glutinosa* – *Fraxinus excelsior* – *Lysimachia nemorum* woodland. On the drier or more neutral margins of these areas other tree species, notably ash *Fraxinus excelsior* and elm *Ulmus* spp., may become abundant in the canopy.

Understorey species include Hazel *Corylus avellana*, Field Maple *Acer campestre* and Blackthorn *Prunus spinosa*. The ground flora is dominated in many of the drier areas by Dog's Mercury *Mercurialis perennis* or by Pendulous Sedge *Carex pendula* on wetter soils. Ramsons *Allium ursinum* is present on flushed slopes.

The main NVC equivalent is W8 *Fraxinus excelsior Acer campestre Mercurialis perennis* woodland. These have some affinities with the *Tilio-Acerion* Ravine woodland under the Habitats Directive. In other situations the alder woods occur as a stable component within transitions to surrounding dry-ground forest, sometimes including other Annex I woodland types. These transitions from wet to drier woodland and from open to more closed communities provide an important facet of ecological variation. The ground flora is correspondingly varied. Some stands are dominated by tall herbs and sedges, for example common nettle *Urtica dioica*, greater tussock-sedge *Carex paniculata*, and meadowsweet *Filipendula ulmaria*, while others have lower-growing communities with creeping buttercup *Ranunculus repens*, common marsh bedstraw *Galium palustre*, opposite-leaved golden-saxifrage *Chrysosplenium oppositifolium* and marsh-marigold *Caltha palustris*.

Qualifying Species:

- **S1308. Barbastelle *Barbastella barbastellus*;**

The barbastelle *Barbastella barbastellus* is a medium-sized species of bat by British standards, weighing between 6-13 grams. Its fur is almost black, usually with very pale or golden brown tips to the hairs giving it a frosted appearance. The under-fur is grey-brown, again often with pale tips to the hairs. The ears are black, short, broad and joined across the forehead and together with the rather squat face give this bat a very distinctive 'pug-like' appearance.

Barbastelle ecology is relatively poorly-known although more information has become available since this SAC was designated. It is a northern temperate species, occurring in upland sites in southern Europe. In the UK it is found in a variety of habitats where suitable roosting and foraging is found. The species forages in mixed habitats, including over water. Barbastelles appear to select cracks and crevices in wood for breeding, mostly in old or damaged trees, but cracks and crevices in the timbers of old buildings may also be used. Maternity colonies may move between suitable crevices within a small area, such as a piece of woodland or a complex of buildings. Caves and underground structures may be used for hibernation. The species is very sensitive to disturbance, together with the loss of roost-sites and food resources.

The barbastelle is one of the UK's rarest mammals. In recent years this species has been found to be more widespread across southern England and south Wales than previously recognised. The Exmoor and Quantock Oakwoods SAC is one of the few sites to be protected by SAC designation for barbastelle bats. A colony of barbastelle is associated with the cracks and crevices of trees within Horner Wood, the lower Barle Valley and the woods on the Quantocks including Alfoxton woods, Hodders Combe and Holford Combe. These trees are used as a summer maternity roost where the female bats gather to give birth and rear their young. Baby bats are usually born in July, sometimes even in early August; females usually produce a single baby, but occasionally twins. Juvenile bats can fly at about 3 weeks, and by 6 weeks can forage for themselves. Research indicates that juveniles follow the adults into their established foraging areas.

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

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

Bechstein's bat *Myotis bechsteinii* is a medium-sized species, with very long ears and a long, pointed, bare, pink face. It has shaggy light-to reddish-brown fur on its back and contrasting greyish white-tipped fur on its underside. The species is closely associated with mature deciduous woodland and appears to select old woodpecker holes or rot holes in trees for breeding. It also occurs in coniferous woodland in some areas. Maternity colonies may move between suitable crevices within a small area, such as a piece of woodland. It is believed to hibernate in hollow trees and sometimes in underground localities.

Bechstein's bat *Myotis bechsteinii* is one of the UK's rarest mammals, recorded from only a small number of sites in southern England and Wales. Recent surveys indicate hotspots in the distribution of breeding colonies in Dorset/Somerset, southwest Hampshire/IOW and Sussex. Bechstein's have been recorded on the Quantocks - two breeding females being captured in Holford Combe and Alfoxton Woods, and then traced back to roosts in Alfoxton Park (adjoining the SAC boundary). Very few maternity roosts are

currently known, but surveys of lactating females or females in breeding season are being found more regularly and in tree roosts. The great majority of other records come from caves or abandoned mines, which are important hibernation sites for a range of bat species.

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

- **S1355. Otter *Lutra lutra*;**

Otters are semi aquatic, living mainly along rivers. They mainly eat fish, though crustaceans, frogs, voles and aquatic birds may also be taken. Being at the top of the food chain, an otter needs to eat up to 15% of its body weight in fish daily.

Otters are solitary shy animals, usually active at dusk and during the night. Otters can travel widely over large areas. Some are known to use 20 km or more of river habitat. Otters tend to live alone as they are very territorial. Otters deposit faeces in prominent places along a watercourse (known as spraints) which have a characteristic sweet musky odour. These mark their range which may help neighbouring animals keep in social contact with one another. Otters are found on most Exmoor and other rivers in Somerset and records show use of all the rivers within the SAC.

The otter is also a 'European Protected Species' in the UK, and it is an offence to disturb, capture, injure or kill an otter (either on purpose or by not taking enough care), or to damage, destroy or obstruct access to its breeding or resting places, without first getting a licence.

General References

Ratcliffe, D. A. 1968. An ecological account of the Atlantic bryophytes of the British Isles. *New Phytologist*, 67, 365-439.

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

Site-specific seasonality of SAC features

The table below highlights in grey those months in which significant numbers of each qualifying feature are most likely to be present at the SAC during a typical calendar year. This table is provided as a general guide only. The presence of the features may vary depending on weather conditions.

Unless otherwise indicated, the months shown below are primarily based on information relating to the general months of occurrence of the feature in the UK. Where site-based evidence is available and has been used to indicate below that significant numbers of the feature are typically present at this SAC outside of the general period, the site-specific references have been added to indicate this.

Applicants considering projects and plans scheduled in the periods highlighted in grey would benefit from early consultation with Natural England given the greater scope for there to be likely significant effects that require consideration of mitigation to minimise impacts to qualifying features during the principal periods of site usage by those features. The months which are *not* highlighted in grey are not ones in which the features are necessarily absent, rather that features may be present in less significant numbers in typical years. Furthermore, in any given year, features may occur in significant numbers in months in which typically they do not. Thus, applicants should not conclude that projects or plans scheduled in months not highlighted in grey cannot have a significant effect on the features. There may be a lower likelihood of significant effects in those months which nonetheless will also require prior consideration.

Any assessment of potential impacts on the features must be based on up-to-date count data and take account of population trends evident from these data and any other available information. Additional site-based surveys may be required.

Feature	Season	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Site-specific references where available
Barbastelle and Bechstein's bats	Breeding													

Table 1: Supplementary Advice for Qualifying Features: H91AO. Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles and H91EO. Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-padion*, *Alnion incanai*, *Salicion albae*)

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)														
Extent and distribution of the feature	Extent of the feature within the site	Maintain the total extent of the feature to not less than 1545 ha as measured for each individual SSSI a follows:	<p>There should be no measurable reduction (excluding any trivial loss) in the extent and area of this feature, and in some cases, the full extent of the feature may need to be restored.</p> <p>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.</p> <p>The extent of an Annex I habitat feature covers the sum extent of all of the component vegetation communities present and may include transitions and mosaics with other closely-associated habitat features. Where a feature is susceptible to natural dynamic processes, there may be acceptable variations in its extent through natural fluctuations. Where a reduction in the extent of a feature is considered necessary to meet the Conservation Objective for another Annex I feature, Natural England will advise on this on a case-by-case basis.</p> <p>For this feature tree roots (particularly of veteran trees) can extend a considerable distance beyond the boundary of the site - they can be impacted by soil compaction (such as caused by vehicles or construction works); agricultural operations or other soil disturbance (like trenches); and agro chemicals or other chemicals which get into the soil.</p> <p>Any loss of woodland area - whether at the edge or in the middle of a site will reduce the core woodland area where woodland conditions are found - these support significant assemblages of species dependent on woodland conditions (e.g. lichens and bryophytes - being one example). Loss of any woodland area which fragments a site into different parts will clearly disturb the movement of species between the remaining parts of the woodland.</p>	<p>Boyce, 2009.</p> <p>Boyce, 2012.</p> <p>English Nature, 2000.</p> <p>Goldberg and Kirby, 2013.</p> <p>National Trust, 1990.</p> <p>National Trust, 2007.</p> <p>National Trust, 2011.</p> <p>National Trust, 2015.</p> <p>Teverson, 1995.</p> <p>This attribute will be periodically monitored as part of Natural England's SSSI condition assessments</p>														
		<table border="1"> <thead> <tr> <th>SSSI</th> <th>Oak-woods</th> <th>Alluvial forest</th> </tr> </thead> <tbody> <tr> <td>The Quantocks</td> <td>307 ha</td> <td>1 ha</td> </tr> <tr> <td>North Exmoor</td> <td>386 ha</td> <td>26 ha</td> </tr> <tr> <td>Barle Valley</td> <td>357 ha</td> <td>7 ha</td> </tr> <tr> <td>Watersmeet</td> <td>250 ha</td> <td>1 ha</td> </tr> <tr> <td>West Exmoor Coast & Woods</td> <td>210 ha</td> <td>0 ha</td> </tr> </tbody> </table>			SSSI	Oak-woods	Alluvial forest	The Quantocks	307 ha	1 ha	North Exmoor	386 ha	26 ha	Barle Valley	357 ha	7 ha	Watersmeet	250 ha
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Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>The area of Old sessile oakwoods includes mainly W11 and W17 woodland, plus W16 to the drier east, but with transitions to W8, W9 & W10 stands within the natural variation in communities within western oakwood type.</p> <p>The area of Alluvial forests on richer soils is mainly W7, with some W8 stands as transitional to drier ground. In some places W9 occurs, as well as closer to the coast above sea cliffs.</p>	
Extent and distribution of the feature	Spatial distribution of the feature within the site	Maintain the distribution and configuration of the feature, including where applicable its component vegetation types, across the site	<p>A contraction in the range, or geographic spread, of the feature (and its component vegetation and typical species, plus transitional communities) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes.</p> <p>This may also reduce and break up the continuity of a habitat within a site and how well its typical species are able to move around the site to occupy and use habitat. Such fragmentation can impact on their viability and the wider ecological composition of the Annex I habitat. Smaller fragments of habitat can typically support smaller and more isolated populations which are more vulnerable to extinction.</p> <p>These fragments also have a greater amount of open edge habitat which will differ in the amount of light, temperature, wind, and even noise that it receives compared to its interior. These conditions may not be suitable for some of the typical and more specialist species associated with the Annex I habitat feature.</p>	<p>Boyce, 2009.</p> <p>Boyce, 2012.</p> <p>English Nature, 2000.</p> <p>Goldberg and Kirby, 2013.</p> <p>National Trust, 1990.</p> <p>National Trust, 2007.</p> <p>National Trust, 2011.</p> <p>National Trust, 2015.</p> <p>Teverson, 1995.</p> <p>This attribute will be periodically monitored as part of Natural England's SSSI condition assessments</p>
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): W11, W16, W17 forming a mosaic, together with W8, W9 and W10, and to W7 on wetter ground.	<p>This habitat feature will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management. In the UK these have been categorised by the National Vegetation Classification (NVC).</p> <p>Maintaining or restoring these characteristic and distinctive vegetation types, and the range of types as appropriate, will be</p>	<p>Boyce, 2009.</p> <p>Boyce, 2012.</p> <p>English Nature, 2000.</p> <p>Goldberg and Kirby, 2013.</p> <p>National Trust, 1990.</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			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).	National Trust, 2007. National Trust, 2011. National Trust, 2015. Teverson, 1995. This attribute will be periodically monitored as part of Natural England's SSSI condition assessments
Structure and function (including its typical species)	Vegetation structure - canopy cover	Maintain an appropriate tree canopy cover across the feature, which will typically be between 30-90% except in wood pasture stands or in lichen rich stands where the minimum cover is 20%.	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.	Boyce, 2009. Boyce, 2012. This attribute will be periodically monitored as part of Natural England's SSSI condition assessments
Structure and function (including its typical species)	Vegetation structure - open space	Maintain areas of permanent/temporary open space within the woodland feature, typically to cover approximately 10% of area.	Woodland structure includes variations in age, tree form, layering, the distribution and abundance of open space and dead wood. It plays a critical role in woodland ecosystem functioning. The targets set within this attribute should reflect the most appropriate structure for the woodland feature on a	Boyce, 2009. Boyce, 2012. This attribute will be periodically monitored as part of Natural

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>particular site, taking account of its known interest, history, past management and the landscape context.</p> <p>Having some open, sunlit and largely tree-less areas as part of the woodland community is often important to facilitate natural tree and shrub regeneration and also to provide supporting habitat for specialist woodland invertebrates, birds, vascular 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.</p>	England's SSSI condition assessments
Structure and function (including its typical species)	Vegetation structure - old growth	Maintain the extent and continuity of undisturbed, mature/old growth stands (typically at least 10% of the feature at any one time) or the assemblages of veteran and ancient trees at 5-10 trees per hectare.	Good woodland structure includes variations in age, tree form, layering, the distribution and abundance of open space and dead wood. It plays a critical role in woodland ecosystem functioning. For this habitat type, old or over-mature elements of the woodland are particularly characteristic and important features, and their continuity should be a priority.	<p>Boyce, 2009.</p> <p>Boyce, 2012.</p> <p>Mosaic Mapping, 2010.</p> <p>Mosaic Mapping, 2011.</p>
Structure and function (including its typical species)	Vegetation structure - dead wood	Maintain the continuity and abundance of standing or fallen dead and decaying wood, typically between 30 - 50 m ³ per hectare of standing or fallen timber or 3-5 fallen trees >20cm diameter per hectare, and minimum 4-10 standing dead trees per hectare	<p>Woodland structure includes variations in age, tree form, layering, the distribution and abundance of open space and dead wood. It plays a critical role in woodland ecosystem functioning.</p> <p>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.</p>	This attribute will be periodically monitored as part of Natural England's SSSI condition assessments
Structure and function (including its typical species)	Vegetation structure - age class distribution	Maintain at least 3 age classes (pole stage/ medium/ mature) spread across the average life expectancy of the commonest trees.	A distribution of size and age classes of the major site-native tree and shrub species that indicate the woodland will continue in perpetuity, and will provide a variety of the woodland habitats and niches expected for this type of woodland at the site in question.	<p>Boyce, 2009.</p> <p>Boyce, 2012.</p> <p>This attribute will be periodically monitored as part of Natural England's SSSI condition assessments</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Structure and function (including its typical species)	Vegetation structure - shrub layer	Maintain an understorey covering at least 1-30% of total stand area, except (a) in wood pasture stands where there is no effective minimum and (b) in lichen-rich areas where dense shrub or climber growth particularly of evergreens e.g. rhododendron, ivy and holly around tree trunks no more than 10% and (c) on Exmoor where typically 10% is more appropriate.	Woodland structure includes variations in age, tree form, layering, the distribution and abundance of open space and dead wood. It plays a critical role in woodland ecosystem functioning. The targets set within this attribute should reflect the most appropriate structure for the woodland feature on a particular site, taking account of its known interest, history, past management and the landscape context. A higher target for W7 and W8 may be appropriate.	Boyce, 2009. Boyce, 2012. Sanderson, 2009. Sanderson, 2011. This attribute will be periodically monitored as part of Natural England's SSSI condition assessments
Structure and function (including its typical species)	Vegetation structure - woodland edge	Maintain a graduated woodland edge into adjacent semi-natural open habitats, other woodland/ wood-pasture types or scrub.	Woodland edge is defined as being the transitional zone between the forest feature and adjacent but different habitat types - the best woodland edges will have a varied structure in terms of height and cover. Many typical forest species make regular use of the edge habitats for feeding due to higher herb layer productivity and larger invertebrate populations. Grasslands / arable fields managed with high doses of agro-chemicals could potentially not allow this gradation of woodland edge and could have other impacts on the integrity of the site (pollution/ nutrient enrichment etc.).	
Structure and function (including its typical species)	Adaptation and resilience	Maintain the resilience of the feature by ensuring a diversity (at least 3 species) of site-native trees (e.g. sessile oak, birch, holly, rowan, willow) across the site.	The overall vulnerability of this SAC to climate change has been assessed by Natural England (2015) as being low, taking into account the sensitivity, fragmentation, topography and management of its habitats. This means that this site is considered to be vulnerable overall but are a lower priority for further assessment and action. Individual species may be more or less vulnerable than their supporting habitat itself. In many cases, change will be inevitable so appropriate monitoring would be advisable. 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	Natural England, 2015.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>ecological system to cope with, and adapt to environmental stress and change whilst retaining the same basic structure and ways of functioning.</p> <p>Such environmental changes may include changes in 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.</p>	
Structure and function (including its typical species)	Browsing and grazing by herbivores	Maintain browsing at a low to moderate level that allows a well-developed understorey with no obvious browse line, & lush ground vegetation with some grazing sensitive species evident (bramble, ivy etc.), and tree seedlings and sapling common in larger gaps.	<p>Herbivores, especially deer, are an integral part of woodland ecosystems. They are important in influencing woodland regeneration, composition and structure and therefore in shaping woodland wildlife communities. In general, both light grazing and browsing is desirable to promote both a diverse woodland structure and continuous seedling establishment. Short periods with no grazing at all can allow fresh natural regeneration of trees, but a long-term absence of herbivores can result in excessively dense thickets of young trees which shade out ground flora and lower plant species. However, heavy grazing by deer or sheep prevents woodland regeneration, and can cause excessive trampling and/or poaching damage, canopy fragmentation, heavy browsing, bark stripping and a heavily grazed sward.</p> <p>Higher levels of browsing are tolerated on this site as wood pasture origin and structure are present in many areas, large woodland blocks are grazed by red deer and grazing is critical for the maintenance of the oak woodland lichen interest feature. Without grazing the lower plants would be shaded out by growth of ground flora, undergrowth shading trunks and epiphytes such as ivy.</p>	<p>Boyce, 2009.</p> <p>Boyce, 2012.</p>
Structure and function (including its	Regeneration potential	Maintain and restore the potential for sufficient natural regeneration of desirable trees and shrubs; typically tree seedlings of	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	<p>Boyce, 2009.</p> <p>Boyce, 2012.</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
typical species)		desirable species (measured by seedlings and <1.3m saplings - above grazing and browsing height) should be visible in sufficient numbers in large (> 1ha) canopy gaps, at the wood edge and/or as regrowth as appropriate to maintain canopy density over a 10 year (Quantocks) or 50 year (Exmoor) period	<p>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.</p> <p>Less regeneration (50 year period) is accepted on this site as wood pasture origins are present in many areas, large woodland blocks are grazed by red deer and grazing is critical for the maintenance of the oak woodland lichen interest feature. Without grazing the lower plants would be shaded out by growth of ground flora, undergrowth shading trunks and epiphytes such as ivy.</p>	This attribute will be periodically monitored as part of Natural England's SSSI condition assessments
Structure and function (including its typical species)	Tree and shrub species composition	<p>Maintain or restore a canopy and under-storey of which 95% is composed of site native acceptable naturalised species trees and shrubs: sessile oak <i>Quercus petraea</i> and pedunculate oak <i>Q. robur</i>, ash <i>Fraxinus excelsior</i>, birch <i>Betula</i> spp., holly <i>Ilex aquifolium</i>, alder <i>Alnus glutinosa</i>, hazel <i>Corylus avellana</i>, rowan <i>Sorbus aucuparia</i> and native whitebeams <i>Sorbus</i> spp. sallows <i>Salix</i> spp., hawthorn <i>Crataegus monogyna</i>, field maple <i>Acer campestre</i> and yew <i>Taxus baccata</i>.</p> <p>On the Quantocks holly >10% cover is not acceptable</p> <p>Sessile oak to be present in areas away from W7 areas and providing at least 30% cover in</p>	<p>Native trees and shrubs in general support a greater diversity of associated species than non-native species, especially amongst groups of invertebrates which depend directly on trees for food and shelter. There are many plants and animals which use or co-exist with non-native trees, but many rare and threatened woodland species are specialists adapted to one or a few native trees or shrub species (birches, willows and oaks, are examples of trees that host many specialist insect species).</p> <p>Beech, sweet chestnut and sycamore are not site native but can be important in some areas. Sycamore can be important for lichens - along river valleys tolerate up to 10-20% in larger age categories. Beech or sweet chestnut is acceptable as mature/veterans or locally where mapped as dominant stands with little prospects of restoration to Annex I habitat type.</p> <p>Recent guidance (Natural England, 2009) on dealing with the changing distribution of tree species suggests decisions should be taken at a site level with reasons for either (a) a presumption towards acceptance of a species in a particular site or (b) towards management of a species in a particular site.</p> <p>The oak woodland (in the widest sense with sessile oak, ash, field maple, holly, alder, hazel, birch, hawthorn and sallow all</p>	<p>Boyce, 2009.</p> <p>Boyce, 2012.</p> <p>Natural England, 2009.</p> <p>This attribute will be periodically monitored as part of Natural England's SSSI condition assessments</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		the canopy of mature stands over feature as a whole.	significant) and its exceptional lichen interest here is considered sufficiently important to generally aim to maintain the past native tree and shrub composition as closely as possible, whilst accepting change is inevitable (cf Chalara). In some areas where composition is more mixed up to 20% Beech, sycamore and other naturalised species (except rhododendron) should be accepted.	
Structure and function (including its typical species)	Key structural, influential and/or distinctive species	<p>Maintain or restore the abundance of the species listed below to enable each of them to be a viable component of the Annex 1 habitat:</p> <p>Epiphytic lichen assemblage</p> <p>Rich Atlantic bryophyte communities including oceanic species such as <i>Hyocomium armoricum</i>, <i>Plagiochila spinulosa</i>, <i>Scapania gracilis</i>, <i>Saccogyna viticulosa</i>, the rare fern <i>Hymenophyllum wilsonii</i>, and gametophyte of Schedule 8 plant <i>Trichomanes speciosum</i>.</p> <p>Endemic and rare <i>Sorbus</i> species including: Slender whitebeam <i>Sorbus subcuneata</i>, Bloody whitebeam <i>S. vexans</i>, Margaret's whitebeam <i>S. margaretae</i> and No Parking whitebeam <i>S. admonitor</i>.</p> <p>Breeding woodland birds including particularly strong populations of pied flycatcher <i>Ficedula hypoleuca</i>, wood warbler <i>Phylloscopus sibilatrix</i> and redstart <i>Phoenicurus</i></p>	<p>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;</p> <ul style="list-style-type: none"> • 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. <p>There may be natural fluctuations in the frequency and cover of each of these species. The relative contribution made by them to the overall ecological integrity of a site may vary, and Natural England will provide bespoke advice on this as necessary. The list of species given here for this Annex I habitat feature at this SAC is not necessarily exhaustive. The list may evolve, and species may be added or deleted, as new information about this site becomes available.</p>	<p>For bryophytes: Holyoak, 2007. Callaghan, 2010.</p> <p>For fungi, including lichens: Green, 1993.</p> <p>National Trust, 2015.</p> <p>Sanderson, NA, 2009.</p> <p>Sanderson, NA, 2009.</p> <p>Sanderson, NA, 2009.</p> <p>Sanderson, NA, 2009.</p> <p>Sanderson, 2009.</p> <p>Sanderson, NA, 2011.</p> <p>British Lichen Society, 2013.</p> <p>For <i>Sorbus</i>: Rich, <i>et al.</i> 2010.</p> <p>For birds: Boyce, and Freshney, 2014.</p> <p>National Trust, 2015.</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		<p><i>phoenicurus</i> together with the rarer Lesser Spotted woodpecker <i>Dryobates minor</i></p> <p>Red wood ant <i>Formica rufa</i></p> <p>Wood-decay invertebrate fauna (saproxylics)</p> <p>Deadwood fungi</p>		<p>For invertebrates:</p> <p>National Trust, 2015.</p> <p>National Trust, 2017</p> <p>Boyce, 2002.</p> <p>Alexander, 1996.</p> <p>Duff, A, 1994.</p> <p>Hodge, 1994.</p>
Structure and function (including its typical species)	Invasive, non-native and/or introduced species	<p>Ensure invasive and introduced non-native species are either rare or absent, but if present are causing minimal damage to the feature</p> <p>Maximum acceptable cover of rhododendron or Himalayan/ Japanese knotweed = 0%</p>	<p>Invasive or introduced non-native species are a serious potential threat to the biodiversity of native and ancient woods, because they are able to exclude, damage or suppress the growth of native tree, shrub and ground species (and their associated typical species), reduce structural diversity and prevent the natural regeneration of characteristic site-native species.</p> <p>Once established, the measures to control such species may also impact negatively on the features of interest (e.g. use of broad spectrum pesticides). Such species can include Rhododendrons, Montbretia, snowberry, Japanese knotweed, giant hogweed and Himalayan balsam, for example. Similarly, this would include pheasants, rabbits and non-native invertebrate 'pest' species.</p>	<p>Boyce, 2009.</p> <p>Information on the distribution of knotweed is available from the Exmoor Knotweed Control Project</p>
Structure and function (including its typical species)	Soils, substrate and nutrient cycling	<p>Maintain the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungal: bacterial ratio, to within typical values for the habitat.</p>	<p>Soil is the foundation of basic ecosystem function and a vital part of the natural environment. Its properties strongly influence the colonisation, growth and distribution of those plant species which together form vegetation types, and therefore provides a habitat used by a wide range of organisms.</p> <p>Soil biodiversity has a vital role to recycle organic matter. Changes to natural soil properties may therefore affect the</p>	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			ecological structure, function and processes associated with this Annex I feature.	
Structure and function (including its typical species)	Root zones of ancient trees	Maintain the soil structure within and around the root zones of the mature and ancient tree cohort in an un-compacted condition	<p>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.</p> <p>Unless carefully managed, activities such as construction, forestry management and trampling by grazing livestock and human feet during recreational activity may all contribute to excessive soil compaction around ancient trees.</p>	
Supporting processes (on which the feature relies)	Air quality	Restore 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).	<p>This habitat type is considered sensitive to changes in air quality. Exceedance of these critical values for air pollutants may modify the chemical status of its substrate, accelerating or damaging plant growth, altering its vegetation structure and composition and causing the loss of sensitive typical species associated with it.</p> <p>Critical Loads and Levels are recognised thresholds below which such harmful effects on sensitive UK habitats will not occur to a significant level, according to current levels of scientific understanding. There are critical levels for ammonia (NH₃), oxides of nitrogen (NO_x) and sulphur dioxide (SO₂), and critical loads for nutrient nitrogen deposition and acid deposition.</p> <p>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</p>	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>measures to tackle diffuse air pollution, within realistic timescales.</p> <p>A 'restore' target has been included here as the maximum Critical Loads and Levels are being exceeded and present a risk to this vegetation.</p>	
Supporting processes (on which the feature relies)	Hydrology	At a site, unit and catchment level, maintain natural hydrological processes to provide the conditions necessary to sustain the feature within the site	<p>Defining and maintaining the appropriate hydrological regime is a key step in moving towards achieving the conservation objectives for this site and sustaining this feature. Changes in source, depth, duration, frequency, magnitude and timing of water supply can have significant implications for the assemblage of characteristic plants and animals present.</p> <p>This target is generic and further site-specific investigations may be required to fully inform conservation measures and/or the likelihood of impacts. This is included as disruption/damage to hydrological processes could be caused by activities at some distance from the site boundary, e.g. through extraction of ground or surface waters; diverting or damming river channels; pollution of water source; channel alignment that disrupts natural geomorphological processes; tunnelling etc.</p>	<p>Environment Agency SW Region. 2005.</p> <p>See River Basin Management Plans at https://www.gov.uk/government/collections/river-basin-management-plans-2015 and Catchment Flood Management Plans for North Devon or West Somerset at https://www.gov.uk/government/collections/catchment-flood-management-plans#south-west-river-basin-district</p>
Supporting processes (on which the feature relies)	Illumination	Ensure artificial light is maintained below a level which is unlikely to affect natural phenological cycles and processes to the detriment of the feature and its typical species at this site.	<p>Woodland biodiversity has naturally evolved with natural patterns of light and darkness, so disturbance or modification of those patterns can influence numerous aspects of plant and animal behaviour.</p> <p>For example, light pollution (from direct glare, chronically increased illumination and/or temporary, unexpected fluctuations in lighting) can affect animal navigation, competitive interactions, predator-prey relations, and animal physiology. Flowering and development of trees and plants can also be modified by un-natural illumination which can disrupt natural seasonal responses.</p>	See for example Sky Quality data in the Exmoor National Park IDSA Dark Sky Places Annual Report October 2014 -2015
<p>Version Control Advice last updated: 13 March 2019: Added additional survey information in Extent of feature within site attribute.</p> <p>Variations from national feature-framework of integrity-guidance:</p>				

Attributes	Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
<p>The targets for some attributes listed above include both 'maintain' or 'restore' objectives. This is because this SAC is an extensive complex of geographically-separate component sites which are currently in different states of condition. Overall, both objectives will be applicable to the SAC but these will differ between each component site depending on its particular circumstances. Natural England will be able to provide further specific advice on request.</p> <p>Browsing and grazing by herbivores and Regeneration potential have adapted to follow the relevant component SSSI Favourable Condition Tables where browsing is acceptable at slightly higher levels and regeneration at lower levels to reflect wood pasture conditions or the importance of epiphytic lichens.</p> <p>Vegetation structure - canopy cover and Vegetation structure - shrub layer adapted to follow the relevant component SSSI Favourable Condition Tables where tree canopy cover is acceptable at slightly lower levels to reflect wood pasture conditions or the importance of epiphytic lichens.</p> <p>Vegetation structure - old growth and Vegetation structure - deadwood adapted to follow Common Standards Monitoring guidance which is less demanding at minimum 10% (cf. 20%) over-maturity, 5-10 trees/ha (cf. 10 trees/ha) or 3 fallen lying trees >20cm (3-5 trees >30cm).</p>			

Table 2: Supplementary Advice for Qualifying Features: S1323. Bechstein’s bat *Myotis Bechsteinii* and S1308. Barbastelle bat *Barbastella barbastellus*

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Population (of the feature)	Population abundance - maternity colony	<p>Maintain the abundance of the breeding population at a level which is above the baseline at or soon after the time of SAC designation, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.</p> <p>Bechstein’s baseline</p> <p>This baseline was the presence of a maternity colony but no estimate of abundance was known.</p> <p>Barbastelle baseline</p> <p>Population above 51-100 bats</p>	<p>This will ensure there is a viable population of the feature which is being maintained at or increased to a level that contributes as appropriate to its Favourable Conservation Status across its natural range in the UK. Due to the dynamic nature of population change, the target-value given for the population size or presence of this feature is considered to be the minimum standard for conservation/restoration measures to achieve. This minimum-value may be revised where there is evidence to show that a population’s size or presence has significantly changed as a result of natural factors or management measures and has been stable at or above a new level over a considerable period (generally at least 10 years). The values given here may also be updated in future to reflect any strategic objectives which may be set at a national level for this feature.</p> <p>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.</p> <p>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</p>	<p>Greena Ecological Consultancy, 2000.</p> <p>Bat Conservation Trust. 2011.</p> <p>Amec, 2012.</p> <p>Billington, 2000.</p> <p>Kazcanow, 2000.</p> <p>Bat Conservation Trust, 2016 & 2017.</p> <p>Scott & Altringham, 2014.</p>

Attributes	Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		<p>possible, local Natural England staff can advise that the figures stated are the best available.</p> <p>Bechstein's Bat: At Horner Wood, a male Bechstein's was discovered in 1999 c. 300m+ outside the SSSI/SAC but no records of females have since been found. Lures were deployed by G. Billington subsequently but with no positive results. Further survey in 2007-2011 also found no Bechstein's.</p> <p>Despite the 2007-2011 surveys, two nursery tree roosts were found near Holford in the Quantocks by G. Billington in 2012. H. Andrews also recorded Bechstein's droppings, confirmed by DNA, in a tree roost in 2012-13 in Holford Combe.</p> <p>Barbastelle: The data available on the size of the breeding population is imprecise because it is very difficult to count Barbastelle bats. At this site (as most others in Britain) they roost in trees, which means that they are more difficult to discover than bats roosting in buildings.</p> <p>Scott and Altringham (2014) comment on this topic: Barbastelles are particularly difficult to count out of their roosts, because within the favoured zone of woodland, different trees will be used as roosts on different nights depending on the atmospheric conditions and roosting positions under loose bark cannot be sighted from the ground. Billington (2012) concluded that there was a maternity roost in Alfoxton Park adjoining the SAC in the Quantocks, and in addition it is known that there is at least one maternity roost east of the Quantock maternity roosts again outside the SAC to the east of Kilve.</p> <p>The Bat Conservation Trust carries out annual monitoring of the SAC through the National Bat Monitoring Programme using bat detectors from late July to early September. Three transects are done on the Quantocks at Hodder's Combe & Somerton Combe, Holford Combe and Alfoxton; two on Exmoor at Horner woods, one in Stoke Woods and one at Eastwater. The main purpose of this monitoring is to confirm presence or absence of barbastelles and no attempt is made to estimate the size of the population. The presence of barbastelles was recorded from 2009 in all years to date in</p>	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>Quantock transects and from 2011 (but none in 2012) to date in Horner Wood transects. Reports are produced annually, but each includes a summary of the results from previous years. The most recent report held locally is for 2016. In 2017 Barbastelle were found in all Quantocks transects, and in both Horner Wood transects.</p> <p>The population count used as the baseline at the time of SAC designation was based on best estimation from the radio tracking studies from one general bat survey and two Barbastelle targeted surveys over 3 years at Horner Woods. Subsequently the species has been found in the two other independent colonies: in the southern Barle Valley and in the Quantock woods. These were no doubt present before being discovered. The effective baseline must therefore be higher than the current one, perhaps at least double the numbers, but without further survey or specialist involvement, it is currently impossible to estimate.</p>	
Supporting habitat: structure /function	Supporting off-site habitat (flight-lines)	<p>Maintain the presence, structure and quality of any linear landscape features which function as flightlines between the SAC and surrounding foraging areas used by barbastelle and Bechstein's bats.</p> <p>Flightlines should remain unlit, functioning as dark corridors.</p>	<p>Bechstein's bats don't tend to range far from their roosts, generally up to a maximum distance of 1-2.5km, usually closer to 1km (Dietz <i>et al</i> 2010). Though, a few breeding females may choose to roost in hedgerow trees, which have connections to the main woodland habitat. Generally forages within deciduous woodland which contain water bodies, occasionally feeding along woodland edge, treelines and hedgerows.</p> <p>Bechstein's bat generally commutes along linear landscape features such as woodland edge, hedgerows, however, they will cross open fields to reach roost sites and foraging areas. Flightlines will extend beyond the designated site boundary into the wider local landscape</p> <p>Barbastelle bats may forage up to 5km from their maternity roosts, though some individuals in less favourable habitat may forage further to reach suitable feeding grounds (Greenaway, 2001). Generally forages within woodland canopy and margins, though will feed in more open areas i.e. orchards, suburban parks. Commutes along linear landscape features such as woodland edge, hedgerows etc., though will cross extensive open areas (i.e. arable fields) to reach foraging grounds and may feed to a certain extent within these more open areas.</p>	<p>Dietz, <i>et al.</i> 2009</p> <p>Burrows, 2018</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>Typical flightlines used by these species include linear hedgerows, waterways, blocks of scrub, wooded rides and tracks. Flightlines will extend beyond the designated site boundary into the wider local landscape.</p> <p>Two local councils (West Somerset and Sedgmoor) and Exmoor National Park published a guidance document prepared by Somerset County Council (Burrows 2018) for developers who are planning to build near to the SAC. This identifies zones around the SAC and bands within the zone reflect the likely importance of the habitat for bats and proximity to the maternity and other roost sites. Any development activity taking place within these zones has the potential to impact on the SAC.</p>	
Supporting habitat: structure/function	Supporting off-site habitat (foraging areas)	Maintain any core areas of feeding habitat outside of the SAC boundary that are critical to Barbastelles and Bechstein's Bat during their breeding period	<p>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) between them, will be an important element of sustaining the SAC population.</p> <p>The current understanding of key roosts and supporting habitat associated with the SAC have also been used to identify a 15.5 km sustenance zone where Barbastelle bats are likely to be present centred around the maternity roosts. Bands within the zone reflect the likely importance of the habitat for bats and proximity to the maternity and other roost sites. Any development activity taking place within this Zone has the potential to impact on the SAC. A guidance document for developers who are planning to build near to the bat SAC has been produced (Burrows, 2018) which reviews current information and identifies these zones around the SAC.</p> <p>Special consideration is also to be given to habitat within 1 km of roost sites, within Juvenile Sustenance Zones (Burrows 2018). Most barbastelle colonies seem to have one large productive foraging zone very close to the roost woodlands to fulfil the juvenile requirement. Although patches closest to the roost area are usually shared by the colony members these may seasonally be left clear by adults as exclusive juvenile foraging zones.</p>	Burrows, 2018

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
<p>Supporting habitat: structure/function</p>	<p>Woodland site - maternity colony</p>	<p>Maintain the extent and structural diversity of supporting woodland habitat suitable for roosting, feeding and foraging by Barbastelles and Bechstein's bats</p>	<p>The structural diversity of supporting habitat will be important to provide roosting spaces and maintain optimal feeding and foraging conditions in close proximity to maternity roosts; key aspects of woodland structure will include good canopy cover (typically 50-90%), an abundance of standing and fallen dead wood, areas of permanent and open space and the retention of open water and/or wetland features.</p> <p>Barbastelle: In woodland they forage in the most open places such as Horner Side and along rides or track routes, these can include conifer plantations. Despite barbastelle bats using open habitats within the woodland and hedgerows in the fields, they rarely forage along the outer woodland edges, which can often be the favoured feeding places of several other bat species, which was found in the Horner Woods Bat Survey (Billington 2000)</p> <p>The wood pasture/high forest of Ten Acre Cleave/Eastwater and Horner Wood has a good canopy cover from 75-85% with an abundance of standing and fallen dead wood (Boyce, 2009) and also open water for at least some of the year. BurrIDGE wood near Dulverton has less old trees and standing dead wood but similar canopy.</p> <p>The Quantock woodland areas represent some more mature stands of standard oak (sometimes with some beech and sycamore), amongst a wider matrix of neglected coppice, both with a generally closed canopy.</p>	<p>Boyce, 2009.</p> <p>Boyce, 2012.</p>
<p>Supporting processes (on which the feature and/or its supporting habitat relies)</p>	<p>Disturbance from human activity</p>	<p>Control and minimise human access to roost sites</p>	<p>Currently no buildings are known to be used. Any use of buildings should trigger securing these against unauthorised access, which can result in disturbance to bats at critical times of year and which can affect their population viability and use of the site. Grilles on site access points should be maintained where present.</p> <p>There is no evidence that daytime public access to woodland used by barbastelles for summer or winter roosts causes disturbance to these bats. It seems very likely that light pollution during hours of darkness would be disturbing. Tree management that damages actual or potential roosts, carried out for H&S reasons in areas used by the public, or indeed any</p>	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			other reason, would certainly cause serious disturbance to the bats.	
Supporting processes (on which the feature and/or its supporting habitat relies)	Conservation measures	Maintain the management measures (either within and/or outside the site boundary as appropriate) which are necessary to maintain the structure, functions and supporting processes associated with the feature and/or its supporting habitats.	<p>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.</p> <p>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.</p> <p>Barbastelle: The survey work carried out by Billington at Horner Wood showed a concentration of activity of barbastelles, suggesting that the woodland in the Eastwater valley of Horner and below Cloutsham Ball is where most roosts within the SAC were situated. The canopy here has many standard oaks and also ash common. In the Barle Valley records are centred on Burr ridge Wood (SSSI unit 2) where breeding is suspected (reasonable numbers and typical nursery roost types -catastrophic fractures - found) but foraging in the other woods above Tarr steps (SSSI unit 35). On the Quantocks roosts within the SAC are in Alfoxton Wood (Unit 38) and Alfoxton Park (outside SAC in Unit 37) and in Hodder's Combe (Unit 49 and Unit 3) and east of Dowsborough Castle (Unit 3). These parts of the woodland and also other areas of old trees with splits and cracks in the remaining woodland within the SAC should be maintained by a regime of minimum management with little disturbance. Tree roosts should be retained intact and allowed to develop naturally. Sufficient suitable trees should be left throughout the surrounding woodland to provide additional roosting sites.</p> <p>Management Plans for this woodland needs to be very long term, and could include intentionally damaging younger trees to make them suitable roosts at an earlier age.</p> <p>The limited radio-tracking studies that have been carried out here showed that bats travelled as far as 9km away in summer</p>	<p>Boyce, 2009</p> <p>Boyce, 2012</p> <p>Burrows 2018</p> <p>Natural England, 2014</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			nights to forage, and less (4km) in autumn. Thus conservation measures outside the boundary of the SAC are also important e.g. planting new woodlands to provide additional roosts for the future, managing hedges appropriately,	
Supporting habitat: extent and distribution	Extent of supporting habitat	<p>Maintain the total extent of the habitats which support the feature at:</p> <p>Bechstein's Bat: the extent of broadleaved woodland within Quantock part of SAC. Maintain the total extent of the habitat(s) which support the feature (at: broadleaved woodland within Quantock part of SAC</p> <p>Barbastelle: approximately 1067ha (the total extent of broadleaved woodland in SSSIs within the SAC currently supporting breeding roosts)</p>	<p>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.</p> <p>Bechstein's Bat: The extent given here is the sum of broadleaved woodland of the two Annex I habitats for the SSSI that is currently known to have breeding barbastelle (The Quantocks). The extent of habitats used for foraging (or roosting but this is unknown) may be greater than this as the species may use other woodland outside the SAC.</p> <p>Barbastelle: The extent given here is the sum of broadleaved woodland of the two Annex I habitats for the three SSSIs that are known to have breeding barbastelle (North Exmoor; Barle Valley; The Quantocks). The total area of habitats used for foraging and non-breeding roosts is likely to be considerably greater than this as the species will use other woodland and habitats outside the SAC (including in the adjacent Exmoor Heaths SAC), ranging widely for foraging in a variety of habitats.</p> <p>The most important habitats used for foraging were: (a) rough/unimproved grassland (94.5% of the habitat in the colonies range was used for foraging); (b) scattered (gorse) scrub and broadleaved woodland (both >57% use); and (c) Bracken, running water and dense (gorse) scrub (all >25% use).</p>	<p>Billington, 2000</p> <p>Billington, 2001</p>
Supporting habitat: extent and distribution	Distribution of supporting habitat	Maintain the distribution and continuity of the feature and its supporting habitat, including where applicable its component vegetation types and associated	A contraction in the range, or geographic spread, of the feature (and its component vegetation) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. Contraction may also reduce	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		transitional vegetation types, across the site	<p>and break up the continuity of a habitat within a site and how well the species feature is able to occupy and use habitat within the site.</p> <p>Such fragmentation may have a greater amount of open edge habitat which will differ in the amount of light, temperature, wind, and even noise that it receives compared to its interior. These conditions may not be suitable for this feature and this may affect its viability.</p>	
Supporting processes (on which the feature and/or its supporting habitat relies)	Adaptation and resilience	Maintain the feature's ability, and that of its supporting habitat, to adapt or evolve to wider environmental change, either within or external to the site	<p>The overall vulnerability of this SAC to climate change has been assessed by Natural England (2015) as being low, taking into account the sensitivity, fragmentation, topography and management of the species' supporting habitats.</p> <p>This means that this site is considered to be vulnerable overall but are a lower priority for further assessment and action. Individual species may be more or less vulnerable than their supporting habitat itself. In many cases, change will be inevitable so appropriate monitoring would be advisable.</p> <p>This recognises the increasing likelihood of natural habitat features needing to absorb or adapt to wider environmental changes. Resilience may be described as the ability of an ecological system to cope with, and adapt to environmental stress and change whilst retaining the same basic structure and ways of functioning.</p> <p>Such environmental changes may include changes in 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.</p>	Natural England, 2015
Supporting habitat:	Soils, substrate and	Maintain the properties of the underlying soil types, including structure, bulk density, total	Soil supports basic ecosystem function and is a vital part of the natural environment. Its properties strongly influence the colonisation, growth and distribution of those plant species	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
structure/function	nutrient cycling	carbon, pH, soil nutrient status and fungal: bacterial ratio, within typical values for the supporting habitat	which together form vegetation types, and therefore provides a habitat used by a wide range of organisms. Soil biodiversity has a vital role to recycle organic matter. Changes to natural soil properties may therefore affect the ecological structure, function and processes associated with the supporting habitat of this Annex II feature.	
Supporting processes (on which the feature and/or its supporting habitat relies)	Water quantity/quality	Where the feature or its supporting habitat is dependent on surface water and/or groundwater, maintain water quality and quantity to a standard which provides the necessary conditions to support the feature	<p>For many SAC features which are dependent on wetland habitats supported by surface and/or ground water, maintaining the quality and quantity of water supply will be critical, especially at certain times of year. Poor water quality and inadequate quantities of water can adversely affect the structure and function of this habitat type.</p> <p>Typically, meeting the surface water and groundwater environmental standards set out by the Water Framework Directive (WFD 2000/60/EC) will also be sufficient to support the achievement of SAC Conservation Objectives but in some cases more stringent standards may be needed to reflect the ecological needs of the species feature. Further site-specific investigations may be required to establish appropriate water quality standards for the SAC.</p>	
Supporting processes (on which the feature and/or its supporting habitat relies)	Air quality	Maintain or, where necessary, concentrations and deposition of air pollutants at or below the site-relevant Critical Load or Level values given for the feature's supporting habitat on the Air Pollution Information System (www.apis.ac.uk).	<p>The supporting habitat 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 the habitat's 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.</p> <p>Critical Loads and Levels are recognised thresholds below which such harmful effects on sensitive UK habitats will not occur to a significant level, according to current levels of scientific understanding. There are critical levels for ammonia (NH₃), oxides of nitrogen (NO_x) and sulphur dioxide (SO₂), and critical loads for nutrient nitrogen deposition and acid deposition. There are currently no critical loads or levels for other pollutants such as Halogens, Heavy Metals, POPs, VOCs or Dusts. These should be considered as appropriate on a case-by-case basis.</p>	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>Ground level ozone is regionally important as a toxic air pollutant but flux-based critical levels for the protection of semi-natural habitats are still under development. It is recognised that achieving this target may be subject to the development, availability and effectiveness of abatement technology and measures to tackle diffuse air pollution, within realistic timescales.</p> <p>Currently (September 2018) the Air Pollution Information System (APIS) shows that deposition of nitrogen is above the critical load indicating that this pollutant will be affecting the woodland habitat of the barbastelle bats in this SAC. No data are available on the significance of this effect at this site, or if there is any direct effect on the bats themselves.</p>	
<p>Version Control Advice last updated: 4 March 2019: Following stakeholder comments. Additional information added about the bat guidance for planning provided by Somerset County Council.</p>				
<p>Variations from national feature-framework of integrity-guidance: The attributes concerned with the external and internal condition of buildings used by maternity colonies/for hibernation and access to the buildings have been deleted as there are no such buildings within the boundaries of the SAC, the maternity roosts being in trees.</p>				

Table 3: Supplementary Advice for Qualifying Features: S1355. Otter *Lutra lutra*;

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Population (of the feature)	Anthropogenic mortality	Reduce levels of mortality as a result of anthropogenic (man-made) factors so that they are not adversely affecting the overall abundance and viability of the population.	<p>High numbers of otter casualties within or adjacent to SAC catchments will adversely affect the condition and viability of the population and mitigation measures should be initiated as quickly as possible. Causes of mortality may include roads, accidents with fishing equipment (nets, lobster creels), poisoning, pollutants, hunting and acidification/contamination of water courses (which reduces fish populations). It should be noted that otters are also a European protected species, and that it is an offence to deliberately disturb, capture, injure or kill an otter.</p> <p>Records of otter casualties from Somerset and Exmoor are held by Somerset Otter Group and the majority are usually recovered for autopsy and forwarded to Cardiff University.</p>	<p>Somerset Otter Group two-day surveys (2017)</p> <p>The Cardiff University Otter Project carries out autopsies on otters from England, Wales and Scotland.</p>
Population (of the feature)	Population abundance	Maintain the continued presence of an actively-breeding otter population within the SAC, whilst avoiding deterioration from current levels as indicated by the latest mean peak count, estimate or equivalent.	<p>This will ensure there is a viable population of the feature which is being maintained at or increased to a level that contributes as appropriate to its Favourable Conservation Status across its natural range in the UK. Due to the dynamic nature of population change, the target-value given for the population size or presence of this feature is considered to be the minimum standard for conservation/restoration measures to achieve. This minimum-value may be revised where there is evidence to show that a population's size or presence has significantly changed as a result of natural factors or management measures and has been stable at or above a new level over a considerable period (generally at least 10 years). The values given here may also be updated in future to reflect any strategic objectives which may be set at a national level for this feature.</p> <p>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</p>	<p>Somerset Otter Group two-day surveys (2017)</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>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.</p> <p>For otters, it is difficult to estimate population size. It could be assumed that where there is a high frequency of positive signs in an area, such as a large number of spraints (of several ages), that otters are likely to be occupying the site. Breeding will be indicated by the presence of natal dens, cub sightings and intensive otter activity (e.g. feeding, sprainting, pathways through vegetation). DNA analysis of spraints is now being used as a technique for identifying otters.</p> <p>Otter spraints and occasional sightings confirm otters are present on all the Exmoor and Quantock rivers within the SAC. The Somerset Otter Group, based on many years of surveys of fresh spraint laid over two days, estimated that 20-24 individual otters live on Exmoor. This is broadly equivalent to the numbers expected for Exmoor's proportionate area when compared to the whole of Somerset, adjusted for the area in Devon.</p>	
Supporting habitat: extent and distribution	Distribution of supporting habitat	Maintain the distribution and continuity of the feature and its supporting habitat, including where applicable its component vegetation types and associated transitional vegetation types, across the site	A contraction in the range, or geographic spread, of the feature (and its component vegetation) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. Contraction may also reduce and break up the continuity of a habitat within a site and how well the species feature is able to occupy and use habitat within the site. Such fragmentation may have a greater amount of open edge habitat which will differ in the amount of light, temperature, wind, and even noise that it receives compared to its interior. These conditions may not be suitable for this feature and this may affect its viability.	
Supporting habitat: extent and distribution	Extent of supporting habitat	Maintain the total extent of the habitats which support the feature at: 106km of watercourses	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	Explanation of Detailed River Network . Length mapped from NE Webmap within SAC boundary 17/9/18.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>depending on the nature, age and accuracy of data collection, and may be subject to periodic review in light of improvements in data.</p> <p>The SAC contains 106km of river as mapped on the EA Detailed River Network including Primary, Secondary and Tertiary watercourses</p>	
Supporting habitat: structure/function	Abundance of breeding and resting places	Maintain an abundance of natural breeding and resting sites within the site	<p>It should be noted that otters are highly mobile and are likely to spend their time within wider territories, where designated sites only form a proportion of their range and make a contribution to their wider requirements. Otters are a European protected species, and it is an offence to disturb their resting places. Otters will often use many holts at any one time.</p> <p>They may give birth in one, but raise their young in another. Important features of a successful breeding site are the availability of food, limited disturbance and safety from the risk of flooding. It is important to consider the whole site and not just the known holts as appropriate management will influence all of these factors. Some natal den structures have a limited lifespan (e.g. hollow tree trunks, piles of timber etc.) and if alternative opportunities for natal dens are limited, suitable replacements can be created or constructed. Maintaining dense bank vegetation, areas of reed etc. will ensure that there are suitable areas for resting couches.</p>	
Supporting habitat: structure/function	Availability of refugia	Maintain an abundance of dense bankside vegetation to limit significant disturbance to animals	<p>The integrity of the interest feature may be dependent upon the quality of the adjacent habitat outside the boundary of the site, for instance tributaries. This is likely to be the case where bankside vegetation may be an important barrier to disturbing activity but may lie adjacent to and outside the boundary. Nevertheless it will be important to maintain, or in some cases, to restore dense bankside cover.</p>	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Supporting habitat: structure/function	Food availability	Maintain fish biomass within expected natural levels for the supporting habitat (subject to natural fluctuations).	<p>In freshwater, key fish prey sources for otters include eels, salmonids and bullhead. Frogs can also form an important part of the diet, depending on the habitat and time of year. Crayfish and water beetles may also form part of the diet, as well as an occasional waterbird (young coots, moorhens, ducks) or mammal (rabbits, water voles - although this is uncommon).</p> <p>The diet of otters varies depending on the availability of prey, which in turn varies with the time of year. There should be a diverse range of food sources available throughout the year, within the normal expectations of each particular water course. It should be noted however, that otters may take prey from adjacent fisheries which are stocked to an artificially high level, especially where there are numerous stocked ponds on a floodplain.</p> <p>This can lead to artificially high prey densities adjacent to European sites, which might be expected to, in turn, result in artificially high densities of otter on the designated sites. This highlights the importance of biosecurity around stocked fisheries, and if implemented at all artificial still water fisheries on a floodplain might result in a legitimate reduction in otter density.</p>	
Supporting habitat: structure/function	Habitat quality - river habitat	Maintain the quality of supporting river habitat features, using advice for H3260 habitat, based on natural river function, which provides a characteristic biotope mosaic that caters for otters.	Dense bank vegetation, mires and tall vegetation are important for otters, but they will use a long stretch of river and this won't necessarily fall within a protected site. Dense bank vegetation is favoured as resting areas, but otters will often travel some distance to a preferred 'couch' and this will not necessarily be along the edge of the river. The structure and quality of bankside vegetation and other nearby habitats should be maintained, particularly where there is evidence of use by otters. However, it is thought that the most significant determinant of otter usage of a habitat is the abundance of prey (Kruuk et al, 1998)	Kruuk, <i>et al</i> , 1998
Supporting habitat: structure/function	Habitat quality - waterway habitat	Maintain the quality of supporting waterways and habitat features	Smaller tributaries of larger river systems (streams, waters etc) are extremely important for otters and have been shown to have been used more frequently by otters than larger rivers. This is thought to be in part due to differences in fish density and preference for hunting in shallow water with areas of riffles and boulders. Many of these tributaries will be outside the SAC	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			boundary, but some lie in the adjacent Exmoor Heaths SAC or other parts of the SSSIs not included in the SACs.	
Supporting habitat: structure/function	Water flow	Maintain the natural flow regime of the river to that close to what would be expected in the absence of abstractions and discharges (the 'naturalised' flow).	Permanent or long-lasting reductions in flow may affect the availability and diversity of prey. This could lead to otters moving into new areas, increasing the likelihood of conflict with other otters. This may also alter they prey targeted by otters as they may hunt for low-preference food such as birds, rabbits, fish carrion or for frogs, depending on the time of year.	See River Basin Management Plans and Catchment Flood Management Plans for North Devon or West Somerset
Supporting habitat: structure/function	Water quality/quantity	Maintain water quality and quantity to a standard which provides the necessary conditions to support the feature.	<p>For many SAC features which are dependent on wetland habitats supported by surface and/or ground water, maintaining the quality and quantity of water supply will be critical, especially at certain times of year during key stages of their life cycle. Poor water quality and inadequate quantities of water can adversely affect the availability and suitability of breeding, rearing and feeding habitats.</p> <p>Typically, meeting the surface water and groundwater environmental standards set out by the Water Framework Directive (WFD 2000/60/EC) will also be sufficient to support the SAC Conservation Objectives but in some cases more stringent standards may be needed to support the SAC feature. Further site-specific investigations may be required to establish appropriate standards for the SAC. The main impact of water chemistry on this feature is its effect on the food supply. For example, moderate levels of levels of eutrophication may increase certain fish populations, but excessive eutrophication can be detrimental.</p> <p>Excessive acidity in watercourses may also affect fish populations. Impacts from toxic pollutants can be devastating and were the major cause of otter population declines in the 50s, 60s and 70s.</p>	<p>See River Basin Management Plans and Catchment Flood Management Plans for North Devon or West Somerset</p> <p>Environment Agency. Pollution Incidents data, see http://apps.environment-agency.gov.uk/wiyby/37821.aspx</p>
Supporting processes (on which the feature and/or its supporting habitat relies)	Adaptation and resilience	Maintain the feature's ability, and that of its supporting habitat, to adapt or evolve to wider environmental change, either within or external to the site	<p>The overall vulnerability of this SAC to climate change has been assessed by Natural England (2015) as being low, taking into account the sensitivity, fragmentation, topography and management of the species' supporting habitats.</p> <p>This means that this site is considered to be vulnerable overall but are a lower priority for further assessment and action. Individual species may be more or less vulnerable than their</p>	Natural England, 2015

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>supporting habitat itself. In many cases, change will be inevitable so appropriate monitoring would be advisable.</p> <p>This recognises the increasing likelihood of natural habitat features needing to absorb or adapt to wider environmental changes. Resilience may be described as the ability of an ecological system to cope with, and adapt to environmental stress and change whilst retaining the same basic structure and ways of functioning.</p> <p>Such environmental changes may include changes in 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.</p>	
Supporting processes (on which the feature and/or its supporting habitat relies)	Connectivity within and to the site	Ensure there are no significant artificial barriers to the safe passage and movement of otters into, within and away from the site	<p>Barriers such as roads, weirs etc. can generally increase the risk of harm to animals as they traverse or avoid them. If these barriers are considered a problem then mitigating measures could be taken. Otter populations within the SAC are dependent on the integrity of sections of river channel, riparian areas, freshwater still-waters, floodplains and transitional and marine waters that lie outside of the site boundary. Headwater areas and tributaries may not fall within the site boundary, yet otters may use these areas for feeding and these will be critical for sustaining populations within the site.</p> <p>Boundaries to river features on SACs often follow the first break of slope on the bank, with the result that much of the riparian habitat will lie outside the SAC, particularly if the river channel is operating under natural processes and moves laterally over time within the floodplain. It is possible that holts of otters that form part of the population for a SAC may lie on the adjacent floodplain out with the boundary of the SAC.</p>	
Supporting processes	Conservation measures	Maintain the management measures (either within and/or	Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site. Further	Natural England, 2014

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
(on which the feature and/or its supporting habitat relies)		outside the site boundary as appropriate) which are necessary to maintain the structure, functions and supporting processes associated with the feature and/or its supporting habitats.	<p>details about the necessary conservation measures for this site can be provided by contacting Natural England.</p> <p>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.</p>	
Supporting processes (on which the feature and/or its supporting habitat relies)	Water quality : Toxic chemicals	Avoid the presence of pollutants affecting the site, which are potentially toxic to otters.	The major cause of the decline in otter populations in the 60s and 70s was toxic chemicals such as dieldrin and related pesticides. Contaminants that might have an effect on otters may have an indirect effect (e.g. on food supply - organic pollution, eutrophication, acidification from mine waste and acid rain), a mainly direct effect (e.g. oil spillage, radioactivity) or effects of bioaccumulation (e.g. metals, especially mercury, cadmium and lead; pesticides and PCBs). PCBs, organochlorine pesticides and heavy metals all being seen as detrimental to otters, although the use of many of these is now banned.	Environment Agency. Pollution Incidents data, see http://apps.environment-agency.gov.uk/wiyby/37821.aspx
Version Control: N/A				
Variations from national feature-framework of integrity-guidance: N/A				

References

- Alexander KNA, 1996. *Biological Survey - Holnicote Estate, Horner Woods, Somerset*. Deadwood Beetle Fauna. NT Report.
- Amec. 2012. HPC Barbastelle Bat Radio Tracking Study
- Amec, 2012. *HPC Barbastelle Bat Radio Tracking Study – Preliminary Results Summary*. Report by GE Billington to Amec
- Bat Conservation Trust. 2011. *Bechstein's Bat Survey (2011) Final report* September 2007 – September 2011
- Bat Conservation Trust (2016 & 2017). *Common Standards Monitoring through the NBMP. Results 2016 & 2017*.
- Boyce, 2002. *The invertebrate fauna of Dulverton Woods*. Report for ENPA & FC.
- Boyce, D. C. 2009. *An assessment of deer impact and other aspects of ecological condition in Exmoor's upland oak woods, 2008-2009*. Unpublished report to Exmoor National Park Authority. ENPA, Dulverton.
- Boyce, D. C. 2012. *Habitat report for Quantock Woodland and Deer Management Plan*. August 2011. Unpublished Appendix.
- Boyce, D and Freshney, F. 2014. *Exmoor & Quantock Woodland– Breeding bird assemblage survey of SSSI Woodlands 2014*. Report to NE.
- Billington Baseline. 2000. *Guidance* from 14 August 2000.
- British Lichen Society, 2013. *Report on Exmoor & Quantock Meeting June 2013*. Unpublished note.
- Burrows, L. 2018. Barbastelle Bats. Exmoor and Quantocks Oak Woodlands Special Area of Conservation (SAC) Guidance on Development. Version 1.2 – April 2018. Somerset Ecology Services, Planning Control, Somerset County Council. Available at: [https://www.sedgemoor.gov.uk/media/3122/Exmoor-and-Quantocks-SAC-technical-guidance-April-2018/pdf/2018 April Guidance Note Exmoor Quantocks SAC Bats v1-2](https://www.sedgemoor.gov.uk/media/3122/Exmoor-and-Quantocks-SAC-technical-guidance-April-2018/pdf/2018%20April%20Guidance%20Note%20Exmoor%20Quantocks%20SAC%20Bats%20v1-2)
- Callaghan, D. 2010. *Barle Valley SSSI Bryophyte Site Dossier*. Report to NE.
- Dietz, C., von Helversen, O. and Nill, D. 2009. *Bats of Britain, Europe and Northwest Africa*. London: A. & C. Black Publishers Ltd.
- Duff, A. 1994. *Review of the Coleoptera of Horner Wood, Exmoor*. Report for NT Holnicote.
- English Nature SAC site files 2000. *Area of habitat measured from air photos and National Forest Inventory as deciduous semi-natural woodland minus plantations, beech woodland. Individual biological site reports examined to measure separately 91E0 Alluvial forests*.
- Environment Agency SW Region. 2005. *Site characterisation of Exmoor Heaths cSAC and Exmoor and Quantock Oakwoods cSAC*. Review of Consents. Site Characterisation Report 18 May 2005.
- Greena Ecological Consultancy, 2000. Holnicote Estate. *Horner Woods Barbastelle Bat: radio tracking study*. Somerset. National Trust/ English Nature
- Green, EE, 1993. *Horner Wood Fungi Survey*. Report for NT Holnicote.
- Goldberg, E. and Kirby, K. 2013. *Woodland management on the Quantocks SAC to achieve Natural England's conservation objectives*. NE Internal report.
- Hodge, P, 1994. *An invertebrate survey of Ashway Hat Wood and Nine Acre Copse and associated meadows*. Report to NE.
- Holyoak, DT. 2007. *Bryophytes of some Woodlands on Exmoor*. Report to ENPA on surveys in Feb 2007.
- Kazcanow, J. 2000. *Barle Valley Bat Survey*. Report to ENPA.
- Kruuk, H., Carrs, D.N. Conroy J W H & Gaywood, M. 1998. *Habitat use and conservation of otters (Lutra lutra) in Britain: A review*. In: N Dunstone & M Gorman. Behaviour and ecology of riparian mammals. Symposia of the Zoological Society of London, Cambridge University Press

- Mosaic Mapping. 2011. *Horner Wood Tree Survey Part 2*. Report to NT Holnicote.
- Mosaic Mapping. 2010. *A Report of Biological records for Willoughby Cleeve – with particular reference to the Old-Growth Habitat of the Veteran and Ancient trees found there*. Report to NT Holnicote.
- National Trust. 1990. *Biological Survey: West Exmoor Coast, Devon*
- National Trust. 2007. *Nature Conservation Evaluation. Watersmeet, Devon*. (2007 Survey, incorporating 1991 & 1998 Surveys).
- National Trust 2011. *Nature Conservation Evaluation. Holford and Shervage Wood and Holford Fields, Somerset*. (2006 Survey Incorporating 1983 Surveys).
- National Trust, 2015. *Nature Conservation Evaluation. Holnicote: Horner Woods NNR & Clouthsam Cleave – Bagley / Sweetworthy Combe*
- National Trust, 2017. *Biological Survey: West Exmoor Coast, Devon*
- Natural England. 2009. *Guidance on dealing with the changing distribution of tree species*. Technical Information Note TIN053. www.naturalengland.org.uk
- Natural England. 2014. *Exmoor and Quantock Oak woodlands SAC. Natura 2000 Site Improvement Plan*
- Natural England, 2015. *Climate Change Theme Plan and supporting National Biodiversity Climate Change Vulnerability assessments ('NBCCVAs') for SACs and SPAs in England* [Available at <http://publications.naturalengland.org.uk/publication/4954594591375360>].
- Rich, TCG, Houston, L, Robertson, A, and Proctor MCF, 2010. *Whitebeams, Rowans and Service Trees of Britain and Ireland. A monograph of Sorbus L. in Britain and Ireland*. BSBI Handbook No 14. BSBI, London
- Sanderson, NA, 2009. *North Exmoor SSSI – Site Dossier for Lichen Interest*. Report to NE.
- Sanderson, NA, 2009. *Barle Valley SSSI – Site Dossier for Lichen Interest*. Report to NE.
- Sanderson, NA, 2009. *Watersmeet SSSI – Site Dossier for Lichen Interest*. Report to NE.
- Sanderson, NA, 2009. *West Exmoor Coast & Woods SSSI – Site Dossier for Lichen Interest*. Report to NE.
- Sanderson, NA, 2009. *Horner wood NNR Lichen Survey Part 1, Western Combes, Somerset 2012*. Lichen Survey for National Trust.
- Sanderson, NA, 2011. *Lichen survey of woodland at Woody Bay, West Exmoor Coast & Woods SSSI & Doctor's Wood –, Devon 2010*. Report to NE.
- Scott, C. and Altringham, J. 2014. *WC1015: Developing effective methods for the systematic surveillance of bats in woodland habitats in the UK*. Final report to Defra, University of Leeds.
- Teverson, R. 1995. *Horner Wood NNR Management Plan*. Report for NT.