



European Site Conservation Objectives: Supplementary Advice on Conserving and Restoring Site Features

**Dartmoor Special Area of Conservation (SAC)
Site Code: UK0012929**



Blanket Mire (© Andy Guy, Natural England)

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About this document

This document provides Natural England's supplementary advice about the European Site Conservation Objectives relating to Dartmoor SAC. This advice should therefore be read together with the SAC Conservation Objectives available [here](#).

This advice replaces a draft version dated 10 December 2018 following 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

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|--|--|
| Name of European Site | Dartmoor Special Area of Conservation (SAC) |
| Location | Devon |
| Site Map | The designated boundary of this site can be viewed here on the MAGIC website |
| Designation Date | 1 April 2005 |
| Qualifying Features | See section below 7130 Blanket bogs 4030 European dry heaths 4010 Northern Atlantic wet heaths with <i>Erica tetralix</i> 91A0 Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles 1355 Otter <i>Lutra lutra</i> 1106 Salmon <i>Salmo salar</i> 1044 Southern damselfly <i>Coenagrion mercuriale</i> |
| Designation Area | 2,3165.77 hectares |
| Designation Changes | N/A |
| Feature Condition Status | Details of the feature condition assessments made at this site can be found using Natural England's Designated Sites System |
| Names of component Sites of Special Scientific Interest (SSSIs) | North Dartmoor SSSI, South Dartmoor SSSI, East Dartmoor SSSI, Tor Royal Bog SSSI, Dendle's Wood SSSI, Wistman's Wood SSSI |
| Relationship with other European or International Site designations | N/A |

Site background and geography

Dartmoor SAC sits within the southwest peninsula in the centre of Devon. It consists of three separate blocks of upland all lying within the Dartmoor National Park. These three constituent upland blocks contain a diverse range of habitats including large scale mosaics of wet and dry heaths and the most southerly upland peat masses in the UK. These habitats support a range of bird and invertebrate species including Southern damselfly. There are small areas of upland oak woods which support rare bryophyte species, part of which is included within the [Wistman's Wood National Nature Reserve](#) (NNR).

The landscape is described in the National Character Area profile ([NCA 150 – Dartmoor](#)). It is characterised by the underlying granite overlaid with thick deposits of peat. The climate is wet, being heavily influenced by the westerly air flow from the Atlantic. Many of the region's major rivers arise on the SAC.

The habitats continue to be shaped by the agricultural activity that has formed them over hundreds of years. The economy of the area is dominated by tourism with the SAC contributing to the attractiveness of the wider area for visitors and recreation.

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:

- **H7130 Blanket bogs**

Blanket bog occurs on flat or sloping land with poor surface drainage in cool, wet, oceanic climates. The extensive 'blanketing' of the ground with a variable depth of peat gives this habitat type its name.

Dartmoor is the southernmost locality for blanket bog in Europe and is representative of blanket bogs in south-west England. The main vegetation community type at this SAC is M17 *Scirpus cespitosus* – *Eriophorum vaginatum* blanket mire (Rodwell, 1991). Many of the bogs are dominated by purple moor-grass *Molinia caerulea* and micro-topography is poorly developed. There are also widespread peat-cuttings (Luscombe *et al.*, 2016), dug by hand in the 19th Century, but these have re-vegetated and many once again support a healthy cover of *Sphagnum* bog-mosses. Nevertheless, good areas are frequently encountered that are very wet, support frequent and widespread *Sphagnum* mosses of a range of species, and display small-scale surface patterning. Of particular note is the rare *Sphagnum austinii*, which is known to occur at two localities within the SAC.

- **H4030 European dry heaths**

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

Dartmoor is representative of upland heath in south-west England. The site is notable because it contains extensive areas of H4 *Ulex gallii* – *Agrostis curtisii* heath, a type most often found in the lowlands, and H12 *Calluna vulgaris* – *Vaccinium myrtillus* heath, a predominantly upland type. *Calluna* – *Vaccinium* heath generally occupies the steeper, better-drained slopes, with *Ulex* – *Agrostis* heath occurring on the lower slopes of the moor.

A number of predominantly northern species occur on the southern edge of their national range. Plants found on dry heaths that are rare in south-west England include crowberry *Empetrum nigrum* and stag's-horn clubmoss *Lycopodium clavatum*.

- **H4010 Northern Atlantic wet heaths with *Erica tetralix* ('Wet heathland with cross-leaved heath')**

Wet heath usually occurs on acidic, nutrient-poor substrates, such as shallow peats or sandy soils with impeded drainage. The vegetation is typically dominated by mixtures of cross-leaved heath *Erica tetralix*, heather *Calluna vulgaris*, grasses, sedges and *Sphagnum* bog-mosses.

Wet heaths occur in several types of ecological gradient. In the drier areas of the south and east, wet heaths are local and often restricted to the transition zone between H4030 European dry heaths and constantly wet valley mires. In the uplands they occur most frequently in gradients between dry heath and other dry, acid habitats and H7130 Blanket bogs.

Dartmoor is representative of upland wet heath in south-west England. The M15 *Scirpus cespitosus* – *Erica tetralix* wet heath community predominates and together with other mire communities and small areas of drier heathland, forms a distinctive mosaic of vegetation types not fully represented

elsewhere. Smaller amounts of M16 *Erica tetralix* – *Sphagnum compactum* wet heath also occur with transitions to areas of M21 *Narthecium ossifragum* – *Sphagnum papillosum* valley mire.

- **H91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles ('Western acidic oak woodland')**

This habitat type generally comprises a range of woodland types dominated by mixtures of oak (*Quercus robur* and/or *Q. petraea*) and birch (*Betula pendula* and/or *B. pubescens*). It is characteristic of base-poor soils in areas of at least moderately high rainfall in northern and western parts of the UK. Three main areas of oak woodland are included within Dartmoor SAC.

Wistman's Wood is notable as a high-altitude relict surviving on a granite clitter slope. Unusually for old oak woods in the UK, it is dominated by pedunculate oak *Quercus robur* rather than sessile oak *Q. petraea*. The epiphytic and ground-covering bryophyte flora, with filmy ferns, is species-rich, although there are some indications that some species may have declined in recent years, possibly because as the tree canopy has grown conditions below it have become less humid. Wistman's Wood has a well-documented record of change over the last century.

Dendles Wood is dominated by pedunculate oak *Q. robur*, but with substantial areas of beech *Fagus sylvatica* on the lower slopes (considered to be a possible outlier of the native range of beech). The ground flora is a mixture of grasses, bracken *Pteridium aquilinum*, bluebell *Hyacinthoides non-scripta*, with locally many boulders supporting a species-rich carpet of bryophytes. There is a luxuriant epiphytic lichen flora including several rare species.

Black Tor Copse has similarities to Wistman's Wood, consisting of stunted trees developed on granite clitter. The vascular plant species-richness is limited, with much bilberry *Vaccinium myrtillus*, hard-fern *Blechnum spicant* and ivy *Hedera helix*, but the bryophyte and lichen assemblages are very rich including nationally-rare species and others seldom found outside the uplands of Scotland and Wales.

Qualifying Species:

- **S1355 Otter *Lutra lutra***

Otters belong to the same family as weasels, badgers, polecats, pine marten, stoats and mink but are semi aquatic, living mainly along rivers. Otters mainly eat fish, though crustaceans, frogs, voles and aquatic birds may also be eaten. 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.

Many watercourses ranging from major rivers to small streams and brooks arise within the SAC. Otters frequent the watercourses using them for breeding, feeding and moving through the landscape.

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](#).

- **S1106 Salmon *Salmo salar***

The Atlantic salmon *Salmo salar* is an anadromous species (i.e. adults migrate from the sea to breed in freshwater). Spawning takes place in shallow excavations called redds, found in shallow gravelly areas in clean rivers and streams where the water flows swiftly. The young that emerge spread out into other parts of the river.

After a period of 1-6 years the young salmon migrate downstream to the sea as 'smolts'. Salmon have a homing instinct that draws them back to spawn in the river of their birth after 1-3 years in the sea. This behaviour has resulted in genetically distinct stock between rivers and even within individual rivers, with some evidence of further genetic distinctiveness in the tributaries of large rivers.

Salmon are present in the watercourses of the SAC, including the River Dart and tributaries. They migrate in from the sea to breed on the fringes of the SAC and mature within the watercourses before returning as 'smolts' to the sea.

- **S1044 Southern damselfly *Coenagrion mercuriale***

The southern damselfly *Coenagrion mercuriale* has very specialised habitat requirements, being confined to shallow, well-vegetated, base-rich runnels and flushes in open areas or small side-channels of chalk rivers. Most sites are on wet heath. In the UK it occurs mainly in south-west England and in south Wales. It has declined in many places and appears to be present only in low numbers at most of its localities.

The damselfly larvae live in flushes and shallow runnels, often less than 10 cm deep, with slow-flowing water. Adults fly from June to August. Females lay eggs onto submerged plants, and the predatory aquatic larvae probably take two years to mature.

There are three populations of southern damselfly on Dartmoor, one of which occurs within the SAC and one is close to the boundary. As far as is known the populations are isolated from each other and do not function as a metapopulation. The site within the SAC is a valley mire at 280 m altitude and supports a southern damselfly population of between 20–290 individuals, first discovered in 1998. Highest counts used to be recorded in the northern portion of the mire, where springs feed shallow soak-ways that flow through wet heath habitat, but now these occur in the upper section of the southern runnel where the mire has a higher water table with *Sphagnum* bog-mosses dominating.

References

LUSCOMBE, D., GATIS, N., CARLESS, D., ANDERSON, K. & BRAZIER, R. (2016) *Dartmoor peatland investigation and mapping project report*. University of Exeter. Unpublished report for Dartmoor National Park Authority.

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

Table 1: Supplementary Advice for Qualifying Features: H7130 Blanket Bog

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|--|---|---|---|
| Extent and distribution of the feature | Extent of the feature within the site | Maintain the total extent of the H7130 feature at not less than 7996.8 hectares. | <p>There should be no measurable reduction (excluding any trivial loss) in the current extent and area of this feature, and in some cases, the full extent of this habitat 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 and so may be approximate depending on the methods, age and accuracy of data collection. As a result this value may be updated in light of more accurate information.</p> <p>The extent of an Annex I habitat feature covers the sum extent of the likely range of component vegetation communities present and can include any 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.</p> <p>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>NATURAL ENGLAND, (2014a)</p> <p>NATURE CONSERVANCY COUNCIL (1987a).</p> <p>NATURE CONSERVANCY COUNCIL (1987b)</p> <p>NATURAL ENGLAND (Various)</p> <p>ECOLOGICAL SURVEYS (BANGOR) (2005)</p> |
| | Spatial distribution of the feature within the site | Restore the distribution and configuration of the H7130 feature, including where applicable its component vegetation types, across the site | <p>A contraction in the range, or geographic spread, of the feature (its component vegetation and typical species, plus transitional communities) across the site will reduce its overall area, the local diversity and variations in its structure and composition and may undermine its resilience to adapt to future environmental changes. This may also reduce and break up the continuity of a habitat within a site and how well its typical species are able to move around the site to occupy and use habitat.</p> <p>Such fragmentation can impact on their viability and the wider ecological composition of the Annex I habitat. Smaller fragments of habitat can typically support smaller and more isolated populations which are more vulnerable to extinction. These fragments also have a greater amount of open edge habitat which will differ in the amount of light, temperature, wind, and even noise that it receives compared to its interior. These conditions may not be suitable for some of the typical and more specialist species associated with the Annex I habitat feature.</p> <p>Fragmentation of blanket bog is common with areas drying out through</p> | <p>As above</p> <p>NATURAL ENGLAND, (2014b). Site Improvement Plan: Dartmoor (SIP054)</p> |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
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| | | | <p>drainage, and burning encouraging a species-poor community dominated typically by <i>Calluna vulgaris</i> or <i>Molinia caerulea</i>. True bog species become fragmented or are lost. Hydrological fragmentation of the bog system can also occur.</p> <p>A restore target has been set as some areas of the blanket bog have old drainage networks and peat cuttings that have a negative impact on the conservation status of the habitat by reducing the height of the water table and drying out the bog. There are also surface channels present in the blanket bog that are the result of erosion processes initiated by past burning, military training, overgrazing, drainage, atmospheric pollution and peat cutting. These channels continue to erode the peat in some places threatening the hydrology of the remaining bog. In some areas older erosion channels have effectively drained the bog, leading to a drying out of the peat and consequently a change in the vegetation away from bog communities.</p> | |
| Structure and function (including its typical species) | Vegetation community composition | <p>Ensure the component vegetation communities of the H7130 feature are referable to and characterised by the following National Vegetation Classification types;</p> <p>M1 <i>Sphagnum auriculatum</i> bog pool community</p> <p>M2 <i>Sphagnum cuspidatum</i> / <i>recurvum (fallax)</i> bog pool community</p> <p>M3 <i>Eriophorum angustifolium</i> bog pool community</p> <p>M17 <i>Scirpus cespitosus</i> – <i>Eriophorum vaginatum</i> blanket mire</p> <p>M21 <i>Narthecium ossifragum</i> - <i>Sphagnum papillosum</i> mire.</p> | <p>This Annex I 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 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).</p> <p>As blanket bog 'blankets' extensive areas it is not surprising that the habitat supports a range of different vegetation communities. Transitions can occur between bog pools, wetter <i>Sphagnum</i> lawns, through to more mixed terrestrial bog communities associated with both hummocks and hollows. At its margins (normally on the steeper slopes), blanket bog communities will gradually be lost and replaced by wet heath and dry heath communities.</p> <p>The structure and function of blanket bog communities can be heavily influenced by land management, notably drainage, managed rotational burning and grazing. In these situations typical blanket bog communities are replaced by a variety of degraded mire, dry heath) or acid grassland</p> | <p>This attribute will be periodically monitored as part of Natural England's site condition assessments</p> |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
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| | | | vegetation types. Where these vegetation types occur on deeper peats, they should be assessed as blanket bog and restoration back to H7130 blanket bog should be the objective. Note: Blanket bog vegetation can sometimes become established on peats shallower than 0.4m. | |
| Structure and function (including its typical species) | Invasive, non-native and/or introduced species | Ensure invasive and introduced non-native species are either rare or absent, but if present are causing minimal damage to the H7130 feature | Invasive or introduced non-native species can be a serious potential threat to the structure and function of these habitats, because they are able to exclude, damage or suppress the growth of their associated typical species, reduce structural diversity of the habitat and prevent the natural regeneration of characteristic site-native species. Once established, the measures to control such species may also impact negatively on the features of interest (e.g through the use of broad spectrum herbicides). | This attribute will be periodically monitored as part of Natural England's site condition assessments |
| Structure and function (including its typical species) | Presence/cover of woody species | Maintain a low cover (<10% of the area) of scrub and/or trees within stands of H7130. | Native trees and shrubs can occur naturally and tolerate the permanently waterlogged conditions of bog and fen surfaces. An abundance of scrub and trees on bogs and fens is sometimes regarded as detrimental because water is lost by evapotranspiration from the trees and, as the tree canopies develop and close, water is further prevented from reaching the bog surface by interception. This can reduce the amount of water reaching the bog surface. Birch, pine, willow and rhododendron (an invasive non-native species) are the main species of concern. The seeds of most invasive woody species are wind dispersed, so trees are able to establish on raised bog and fen surfaces. This excludes dwarf birch <i>Betula nana</i> and bog myrtle <i>Myrica gale</i> which should be retained if present. | This attribute will be periodically monitored as part of Natural England's site condition assessments |
| Structure and function (including its typical species) | Undesirable species | Ensure the following undesirable competitive species, individually and collectively, are either absent or if present cover less than 1% of H7130 bog vegetation; common bent-grass <i>Agrostis capillaris</i> , Yorkshire fog <i>Holcus lanatus</i> , common reed <i>Phragmites australis</i> , bracken <i>Pteridium aquilinum</i> , creeping buttercup <i>Ranunculus repens</i> . | These are species not considered to be a desirable part of the blanket bog vegetation community as they may spread and out-compete more sensitive typical species. | This attribute will be periodically monitored as part of Natural England's site condition assessments |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|--|--|---|--|
| Structure and function (including its typical species) | Structural diversity | Restore the full range of typical structural features associated with the H7130 feature at this site, e.g. vegetation cover, surface patterning and hydrological zonations | <p>Bogs in particular show varying degrees of structural variation and surface patterning reflecting hydrological gradations (which may be natural or the result of previous damage).</p> <p>These can occur at different macro and micro scales across the habitat and include alternative aquatic and terrestrial surface features, such as pools and hummocks, and terrestrial features such as ridges and hollows. These features will support distinctive patterns of bog vegetation, and so will be sensitive to changes in topography and hydrology.</p> <p>These structural features can be modified or disrupted by management activities such as drainage, burning, grazing, vehicular access and peat digging. These are likely to be missing or poorly represented in degraded blanket bog systems. These components may include areas with noticeably uneven structure at a spatial scale of around 1 m² or less. The unevenness should be the result of <i>Sphagnum</i> hummocks, lawns and hollows, or mixtures of well-developed cotton-grass tussocks and spreading bushes of dwarf-shrubs.</p> <p>A restore target has been set as areas of the blanket bog have old drainage networks and peat cuttings that have a negative impact on the conservation status of the habitat by reducing the height of the water table and drying out the bog. There are also surface channels present in the blanket bog that are the result of erosion processes initiated by past burning, military training, overgrazing, drainage, atmospheric pollution and peat cutting. These channels continue to erode the peat in some places threatening the hydrology of the remaining bog. In some areas older erosion channels have effectively drained the bog, leading to a drying out of the peat and consequently a change in the vegetation away from bog communities.</p> | <p>This attribute will be periodically monitored as part of Natural England's site condition assessments</p> <p>NATURAL ENGLAND, (2014b). Site Improvement Plan: Dartmoor (SIP054)</p> |
| Structure and function (including its typical species) | Physical structure: ground disturbance (and peat erosion) | Significant areas of disturbed and eroding bare ground should not be present. Where present, any affected areas should typically not exceed 1% cover of the total H7130 feature and be considered only as a temporary stage. | Bare ground and eroding peat not only affects the hydrology of bog systems and its associated biodiversity but can also have wider environmental impacts, for example, on water quality. There will also be a carbon loss from the system. | This attribute will be periodically monitored as part of Natural England's site condition assessments |
| Structure and function (including its typical species) | Soils, substrate and nutrient | Restore the properties of the underlying peat, including structure, bulk density, total | 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, | |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
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| typical species) | cycling | <p>carbon, pH, soil nutrient status and fungi/bacteria ratio, to within typical values for the H7130 habitat.</p> <p>For this feature the peat substrate should consist of both acrotelm and catotelm layers.</p> | <p>and therefore provides a habitat used by a wide range of organisms. Soil biodiversity has a vital role to recycle organic matter. Changes to natural soil properties may therefore affect the ecological structure, function and processes associated with this Annex I feature.</p> <p>Blanket peat is typically composed of a variable mixture of remains of Sphagnum spp., cotton-grasses Eriophorum spp. and dwarf Shrubs. Peat is naturally lacking in nutrients with typically low values of calcium, phosphate, nitrate and pH. The peat-forming vegetation and zone of peat deposition ('acrotelm') overlies up to 8 metres of consolidated peat ('catotelm'). To maintain the catotelm/peat body, the peat should be saturated, anaerobic, acidic and nutrient-poor and water movement should be minimal. Any activities that may lower the water table in the peat, exposes peat to oxygen, increases nutrient levels or decreases acidity (or increases it greatly) will be detrimental.</p> | |
| Structure and function (including its typical species) | Adaptation and resilience | <p>Restore the H7130 feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site</p> | <p>This recognises the increasing likelihood of natural habitat features having to absorb or adapt to wider environmental changes. Resilience may be described as the ability of an ecological system to cope with, and adapt to environmental stress and change whilst retaining the same basic structure and ways of functioning. Such environmental changes may include changes in sea levels, precipitation and temperature for example, which are likely to affect the extent, distribution, composition and functioning of a feature within a site.</p> <p>The vulnerability and response of features to such changes will vary. In general terms, the relative sensitivity of blanket bog habitat to climate change is considered to be moderate. 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> <p>The overall vulnerability of this SAC to climate change has been assessed by Natural England (2015) as being moderate, taking into account the sensitivity, fragmentation, topography and management of its [habitats/supporting habitats]. This means that this site is considered to be vulnerable overall but moderately so.</p> <p>This means that some adaptation action for specific issues may be required,</p> | <p>NATURAL ENGLAND 2015 Climate Change Theme Plan and National Biodiversity Climate Change Vulnerability Assessments (NBCCVAs)</p> |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
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| | | | <p>such as reducing habitat fragmentation, creating more habitat to buffer the site or expand the habitat into more varied landscapes and addressing particular management and condition issues. Individual species may be more or less vulnerable than their habitat itself. In many cases, change will be inevitable so appropriate monitoring would be advisable.</p> <p>Rotational burning, drainage and atmospheric deposition can all compromise this feature's ability to adapt, especially in response to the effects of climate change.</p> | |
| Structure and function (including its typical species) | Key structural, influential and/or distinctive species | <p>Restore the abundance of the typical species listed below to enable each of them to be a viable component of the Annex 1 habitat;</p> <p>Assemblage of peat-forming species <i>Sphagnum spp.</i> <i>Eriophorum spp.</i> <i>Tricophorum cespitosum</i>, <i>Erica tetralix</i> <i>Calluna vulgaris</i>, <i>Drosera spp.</i> <i>Sphagnum imbricatum</i> (now either <i>S. affine</i> or <i>S. austinii</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.</p> <p>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> | |
| Supporting processes (on which the feature relies) | Air quality | Restore as necessary the concentrations and deposition of air pollutants to below the site-relevant Critical Load or Level values given for the H7130feature | 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. | More information about site-relevant Critical Loads and Levels for this SAC is available by |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|------------------|--|--|---|
| | | of the site on the Air Pollution Information System (www.apis.ac.uk). | <p>Critical Loads and Levels are recognised thresholds below which such harmful effects on sensitive UK habitats will not occur to a significant level, according to current levels of scientific understanding. There are critical levels for ammonia (NH₃), oxides of nitrogen (NO_x) and sulphur dioxide (SO₂), and critical loads for nutrient nitrogen deposition and acid deposition. There are currently no critical loads or levels for other pollutants such as Halogens, Heavy Metals, POPs, VOCs or Dusts.</p> <p>These should be considered as appropriate on a case-by-case basis. Ground level ozone is regionally important as a toxic air pollutant but flux-based critical levels for the protection of semi-natural habitats are still under development.</p> <p>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>A restore target has been set as nitrogen levels currently exceed the desired critical load levels.</p> | <p>using the 'search by site' tool on the Air Pollution Information System www.apis.ac.uk</p> <p>NATURAL ENGLAND, (2014b). Site Improvement Plan: Dartmoor (SIP054)</p> |
| Supporting processes (on which the feature relies) | Hydrology | At a site, unit and/or catchment level (as necessary), restore natural hydrological processes to provide consistently near-surface water levels necessary to sustain the H7130 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 the 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.</p> <p>For this feature, various land management activities may impact on and interrupt natural hydrological processes and water levels, including artificial drainage, managed burning, wildfires; track construction; afforestation and compaction by trampling and vehicular use. The loss of the acrotelm layer normally reflects significant changes to the hydrology of the bog. An increase in the cover of heather on the bog surface will also indicate a drying-out of the bog, and can lead to further drying out through an increase in sub-surface peat pipes.</p> | NATURAL ENGLAND, (2014b). Site Improvement Plan: Dartmoor (SIP054) |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|--|------------------------------|--|--|--|
| | | | Fire influences the near-surface hydrological functioning of peatland. This leads to enhanced overland flow and higher streamflow peaks and, in combination with a removed vegetation cover, can exacerbate surface erosion. | |
| Supporting processes (on which the feature relies) | Conservation measures | Restore the management measures (either within and/or outside the site boundary as appropriate) which are necessary to restore the structure, functions and supporting processes associated with the H7130 feature | Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site. Further details about the necessary conservation measures for this site can be provided by contacting Natural England. This information will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, Site Management Strategies or Plans, the Views about Management Statement for the underpinning SSSI and/or management agreements. | NATURAL ENGLAND, (2014b). Site Improvement Plan: Dartmoor (SIP054) |
| Version Control Advice last updated: N/A | | | | |
| Variations from national feature-framework of integrity-guidance: None | | | | |

Table 2: Supplementary Advice for Qualifying Features: H4030 European dry heaths

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|--|---|---|--|---|
| Extent and distribution of the feature | Extent of the feature within the site | Restore the total extent of the H4030 feature to 5712.7 hectares. | See supporting notes for this attribute in Table 1 above. | See Table 1 |
| Extent and distribution of the feature | Spatial distribution of the feature within the site | Restore the distribution and configuration of the H4030 feature, including where applicable its component vegetation types, across the site | See supporting notes for this attribute in Table 1 above. | See Table 1 |
| Structure and function (including its typical species) | Vegetation community composition | <p>Ensure the component vegetation communities of the H4030 feature are referable to and characterised by the following National Vegetation Classification types :</p> <p>H4 - <i>Ulex gallii</i> - <i>Agrostis curtisii</i> heath H8 - <i>Calluna vulgaris</i> - <i>Ulex gallii</i> heath H10 - <i>Calluna vulgaris</i> - <i>Erica cinerea</i> heath H12 - <i>Calluna vulgaris</i> - <i>Vaccinium myrtillus</i> heath H18 <i>Vaccinium myrtillus</i> – <i>Deschampsia flexuosa</i> heath</p> | <p>This habitat feature will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management. 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 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).</p> <p>Where stands of dry acid grassland and tall-herb fern have been derived from dwarf-shrub heaths, mostly as a result of heavy grazing:</p> | This attribute will be periodically monitored as part of Natural England's site condition assessments |
| Structure and function (including its typical species) | Vegetation community transitions | Maintain any areas of transition between the H4030 feature and communities which form other heathland-associated habitats, such as dry and humid heaths, mires, acid grasslands, scrub and woodland. | Transitions and zonation between adjacent but different vegetation communities are usually related to naturally-occurring changes in soil, aspect or slope. Such 'ecotones' retain characteristics of each bordering community and can add value in often containing species not found in the adjacent communities. Retaining such transitions can provide further diversity to the habitat feature, and support additional flora and fauna. This is an important attribute as many characteristic heathland species utilise the transitions between vegetation types or use different vegetation types during different stages of their life cycle. | This attribute will be periodically monitored as part of Natural England's site condition assessments |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|---|---|---|---|
| Structure and function (including its typical species) | Cover of dwarf shrubs | Restore an overall cover of dwarf shrub species which is typically between 25-90% | <p>The structural character of the H4030 heathland feature is strongly influenced by the growing habits of its dominant species which in most cases will be ericoids (i.e. plants that look like heathers, including members of the Ericaceae and Empetraceae families).</p> <p>The ericaceous species heather or ling <i>Calluna vulgaris</i>, bell heather <i>Erica cinerea</i>, cross-leaved heath <i>Erica tetralix</i>, bilberry or blaeberry <i>Vaccinium myrtillus</i> and cowberry <i>Vaccinium vitis-idaea</i> are the commonest and most characteristic dwarf-shrubs. Hybrids of bilberry and cowberry can be locally abundant. <i>Calluna</i> is usually the most abundant. Crowberry <i>Empetrum nigrum</i>, another common species in some coastal and transitional heaths, is not strictly ericaceous but is often treated as an ericoid species.</p> | <p>This attribute will be periodically monitored as part of Natural England's site condition assessments</p> <p>NATURAL ENGLAND, 2014. Site Improvement Plan: Dartmoor (SIP054)</p> |
| Structure and function (including its typical species) | Undesirable species | <p>Restore the frequency/cover of the following undesirable species to within acceptable levels to prevent changes in surface condition, soils, nutrient levels or hydrology which may encourage their spread:</p> <p>Bracken <i>Pteridium aquilinum</i>, Common gorse <i>Ulex europaeus</i>, Soft rush <i>Juncus effusus</i>, Pines <i>Picea spp.</i> <i>Rhododendron spp.</i></p> | <p>Undesirable non-woody and woody vascular plants species may require active management to avert an unwanted succession to a different and less desirable state. Often they may be indicative of a negative trend relating to another aspect of a site's structure and function.</p> <p>These species will vary depending on the nature of the particular feature, and in some cases these species may be natural/acceptable components or even dominants.</p> | <p>This attribute will be periodically monitored as part of Natural England's site condition assessments</p> <p>NATURAL ENGLAND, 2014. Site Improvement Plan: Dartmoor (SIP054)</p> |
| Structure and function (including its typical species) | Key structural, influential and/or distinctive species | <p>Restore the abundance of the typical species listed below to enable each of them to be a viable component of the H4030 habitat;</p> <p>Heather <i>Calluna vulgaris</i>, Bell-heather <i>Erica cinerea</i>, western gorse <i>Ulex gallii</i>, bilberry <i>Vaccinium myrtillus</i></p> | See supporting notes for this attribute in Table 1 above | <p>This attribute will be periodically monitored as part of Natural England's site condition assessments</p> |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|---|---|---|---|
| Structure and function (including its typical species) | Functional connectivity with wider landscape | Restore the overall extent, quality and function of any supporting features within the local landscape which provide a critical functional connection with the site | <p>This recognises the potential need at this site to maintain or restore the connectivity of the site to its wider landscape in order to meet the conservation objectives. These connections may take the form of landscape features, such as habitat patches, hedges, watercourses and verges, outside of the designated site boundary which are either important for the migration, dispersal and genetic exchange of those typical species closely associated with qualifying Annex I habitat features of the site.</p> <p>These features may also be important to the operation of the supporting ecological processes on which the designated site and its features may rely. In most cases increasing actual and functional landscape-scale connectivity would be beneficial.</p> <p>Where there is a lack of detailed knowledge of the connectivity requirements of the qualifying feature, Natural England will advise as to whether these are applicable on a case by case basis.</p> | |
| Structure and function (including its typical species) | Adaptation and resilience | Restore the H4030 feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site | See relevant supporting text in Table 1 | Natural England 2015 Climate Change Theme Plan and National Biodiversity Climate Change Vulnerability Assessments (NBCCVAs) |
| Structure and function (including its typical species) | Soils, substrate and nutrient cycling | Maintain the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungal: bacterial ratio, to within typical values for the H4030 habitat. | Soil is the foundation of basic ecosystem function and a vital part of the natural environment. Its properties strongly influence the colonisation, growth and distribution of those plant species which together form vegetation types, and therefore provides a habitat used by a wide range of organisms. Soil biodiversity has a vital role to recycle organic matter. Changes to natural soil properties may therefore affect the ecological structure, function and processes associated with this Annex I feature. | |
| Supporting processes (on which the feature relies) | Conservation measures | Maintain the management measures (either within and/or outside the site boundary as appropriate) which are necessary to restore the structure, functions and supporting processes associated with the H4030 feature | <p>Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site.</p> <p>Further details about the necessary conservation measures for this site can be provided by contacting Natural England, but is typically found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, Site Management Strategies or Plans, the Views about</p> | NATURAL ENGLAND, (2014b). Site Improvement Plan: Dartmoor (SIP054) |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|--------------------|--|--|--|
| | | | <p>Management Statement for the underpinning SSSIs, and/or live management agreements.</p> <p>In general terms, measures necessary for this feature at this SAC include the maintenance of low nutrient levels to maintain high numbers of species through the management activities of grazing, burning, mowing and scrub/tree cutting. Management of natural vegetation succession is a critical aspect of management for this habitat, by a combination of active processes and grazing/cutting. A range of typical invertebrates and plants require bare ground/peat where it is not too frequently disturbed by vehicles or feet.</p> | |
| Supporting processes (on which the feature relies) | Air quality | <p>Restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System www.apis.ac.uk</p> | See supporting notes for this attribute in Table 1 above | <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</p> |

Version Control

Advice last updated: 26 February 2019. Following stakeholder comments, references to heath species and rock types not present on Dartmoor have been removed.

Variations from national feature-framework of integrity-guidance:

'Water quality' and 'hydrology' attributes are not considered to be key attributes of this feature at this site.

Table 3: Supplementary Advice for Qualifying Features: H4010 Northern Atlantic wet heaths with *Erica tetralix*

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|--|--|---|---|
| Extent and distribution of the feature | Extent of the feature within the site | Restore the total extent of the H4010 feature to 4570.6 hectares. | See supporting notes for this attribute in Table 1 above. | See Table 1 above |
| Extent and distribution of the feature | Spatial distribution of the feature within the site | Restore the distribution and configuration of the H4010 feature, including where applicable its component vegetation types, across the site | See supporting notes for this attribute in Table 1 above. | See Table 1 above |
| Structure and function (including its typical species) | Vegetation community composition | <p>Ensure the component vegetation communities of the H4010 feature are referable to and characterised by the following National Vegetation Classification types</p> <p>M15 - <i>Scirpus cespitosus</i> - <i>Erica tetralix</i> wet heath</p> <p>M16 - <i>Erica tetralix</i> - <i>Sphagnum compactum</i> wet heath</p> | <p>This habitat feature will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management. 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 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).</p> | This attribute will be periodically monitored as part of Natural England's site condition assessments |
| Structure and function (including its typical species) | Vegetation community transitions | Maintain any areas of transition between the H4010 feature and communities which form other heathland-associated habitats, such as dry and humid heaths, mires, acid grasslands, scrub and woodland. | <p>Transitions and zonations between adjacent but different vegetation communities are usually related to naturally-occurring changes in soil, aspect or slope. Such 'ecotones' retain characteristics of each bordering community and can add value in often containing species not found in the adjacent communities.</p> <p>Retaining such transitions can provide further diversity to the habitat feature, and support additional flora and fauna. This is an important attribute as many characteristic heathland species utilise the transitions between vegetation types or use different vegetation types during different stages of their life cycle.</p> | This attribute will be periodically monitored as part of Natural England's site condition assessments |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|--|--|--|---|
| Structure and function (including its typical species) | Cover of dwarf shrubs | Restore an overall cover of dwarf shrub species which is typically between 25-90%, and with a high cover and frequency of <i>Erica tetralix</i> | See supporting notes for this attribute in table 2 above. | This attribute will be periodically monitored as part of Natural England's site condition assessments |
| Structure and function (including its typical species) | Tree cover | Maintain the open character of the H4010 feature, with a typically scattered and low cover of trees and scrub (<20% cover) | <p>Scrub (mainly trees or tree saplings above 1 m in height) and isolated trees are usually very important in providing warmth, shelter, cover, food-plants, perches, territorial markers and sources of prey for typical heathland invertebrates and vertebrates. But overall cover of scrub and trees across this habitat feature should be maintained or restored to a fairly sparse level, with a structurally complex edge and with characteristic heathland vegetation as ground cover.</p> <p>If scrub is locally important for any associated species with their own specific conservation objectives, then a higher level of cover will be acceptable. The area of scrub/tree cover should be stable or not increasing as a whole</p> | This attribute will be periodically monitored as part of Natural England's site condition assessments |
| Structure and function (including its typical species) | Vegetation: undesirable species | <p>Restore the frequency/cover of the following undesirable species to within acceptable levels and prevent changes in surface condition, soils, nutrient levels or hydrology which may encourage their spread:</p> <p>Heather <i>Calluna vulgaris</i>, Bell-heather <i>Erica cinerea</i>, western gorse <i>Ulex gallii</i>, bilberry <i>Vaccinium myrtillus</i></p> | <p>Undesirable non-woody and woody vascular plants species may require active management to avert an unwanted succession to a different and less desirable state. Often they may be indicative of a negative trend relating to another aspect of a site's structure and function.</p> <p>These species will vary depending on the nature of the particular feature, and in some cases these species may be natural/acceptable components or even dominants.</p> | This attribute will be periodically monitored as part of Natural England's site condition assessments |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|---|--|---|---|
| Structure and function (including its typical species) | Key structural, influential and/or distinctive species | Restore the abundance of the species listed below to enable each of them to be a viable component of the H4010 habitat; <i>Erica spp. Calluna vulgaris, Vaccinium spp, Sphagnum spp.</i> | See supporting notes for this attribute in Table 1 above. | This attribute will be periodically monitored as part of Natural England's site condition assessments |
| Structure and function (including its typical species) | Functional connectivity with wider landscape | Restore the overall extent, quality and function of any supporting features within the local landscape which provide a critical functional connection with the site | This recognises the potential need at this site to maintain or restore the connectivity of the site to its wider landscape in order to meet the conservation objectives. These connections may take the form of landscape features, such as habitat patches, hedges, watercourses and verges, outside of the designated site boundary which are either important for the migration, dispersal and genetic exchange of those typical species closely associated with qualifying Annex I habitat features of the site. These features may also be important to the operation of the supporting ecological processes on which the designated site and its features may rely. In most cases increasing actual and functional landscape-scale connectivity would be beneficial. Where there is a lack of detailed knowledge of the connectivity requirements of the qualifying feature, Natural England will advise as to whether these are applicable on a case by case basis. | |
| Structure and function (including its typical species) | Adaptation and resilience | Restore the H4010 feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site | See supporting notes for this attribute in Table 1 above. | |
| Supporting processes (on which the feature relies) | Conservation measures | Restore the management measures (either within and/or outside the site boundary as appropriate) which are necessary to restore the structure, functions and supporting processes associated with the H4010 feature | See supporting notes for this attribute in Table 1 above | NATURAL ENGLAND, 2014. Site Improvement Plan: Dartmoor (SIP054) |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|--|--|--|---|
| Supporting processes (on which the feature relies) | Soils, substrate and nutrient cycling | Restore the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungal: bacterial ratio, to within typical values for the H4010 habitat. | <p>Soil is the foundation of basic ecosystem function and a vital part of the natural environment. Its properties strongly influence the colonisation, growth and distribution of those plant species which together form vegetation types, and therefore provides a habitat used by a wide range of organisms. Soil biodiversity has a vital role to recycle organic matter. Changes to natural soil properties may therefore affect the ecological structure, function and processes associated with this Annex I feature.</p> <p>For this feature some stands are very distinct from these typical heaths and have soils that are sub-neutral influenced by flushing with mire mineral-rich water (e.g. NVC types M14 and M15a). It may be assumed that all wet heaths are oligotrophic, with the exception of the permanent seepage slopes of type M14, where mesotrophic conditions may develop in a small-sedge poor-fen</p> | |
| Supporting processes (on which the feature relies) | Air quality | Restore as necessary the concentrations and deposition of air pollutants to below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System www.apis.ac.uk | See supporting notes for this attribute in table 1 above. | More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System www.apis.ac.uk |
| Supporting processes (on which the feature relies) | Water quality | Where the feature is dependent on surface water and/or groundwater, maintain water quality and quantity to a standard which provides the necessary conditions to support the H4010 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. Further site-specific investigations may be required to establish appropriate water quality standards for the SAC.</p> | |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|------------------|---|--|--------------------------------|
| Supporting processes (on which the feature relies) | Hydrology | At a site, unit and/or catchment level (as appropriate), restore a hydrological regime to provide the conditions necessary to sustain the H4010 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 currently generic and further site-specific investigations may be required to fully inform conservation measures and/or the likelihood of impacts.</p> | |
| Version Control | | | | |
| Advice last updated: | | | | |
| Variations from national feature-framework of integrity-guidance: None | | | | |

Table 4: Supplementary Advice for Qualifying Features: H91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|--|--|--|---|
| Extent and distribution of the feature | Extent of the feature within the site | Restore the total extent of the H91A0 feature to 115.8 hectares. | See supporting notes for this attribute in Table 1 above. For this feature, tree roots (particularly of veteran trees) can extend a considerable distance beyond the boundary of the site. 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. an assemblage of typical lichens and bryophytes being one example). | See Table 1 |
| | Spatial distribution of the feature within the site | Maintain the distribution and configuration of the H91A0 feature, including where applicable its component vegetation types, across the site | | |
| Structure and function (including its typical species) | Vegetation - community composition | Ensure the component vegetation communities of the H91A0 feature are referable to and characterised by the following National Vegetation Classification type: <i>W17 - Quercus petraea - Betula pubescens - Dicranum majus</i> woodland | This habitat feature will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management. In the UK these have been categorised by the National Vegetation Classification (NVC). Maintaining or restoring these characteristic and distinctive vegetation types, and the range of types as appropriate, will be important to sustaining the overall habitat feature. This will also help to conserve their typical plant species (i.e. the constant and preferential species of a community), and therefore that of the SAC feature, at appropriate levels (recognising natural fluctuations). | This attribute will be periodically monitored as part of Natural England's site condition assessments |
| Structure and function (including its typical) | Vegetation structure - canopy cover | Maintain an appropriate tree canopy cover across the H91A0 feature, which will typically be between 40-90% | Canopy cover is the overall proportion of vegetative cover consisting of any woody layer ranging from established regeneration to mature and veteran stages. Woodland canopy density and structure is important because it affects ecosystem function and in particular microclimate, litterfall, soil | This attribute will be periodically monitored as |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|-------------------------------|--|--|---|
| species) | | of the site | <p>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 still be important as a form of woodland-pasture).</p> <p>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.</p> | part of Natural England's site condition assessments |
| Structure and function (including its typical species) | Open space | Maintain areas of permanent/temporary open space within the H91A0 woodland feature, typically to cover approximately 10% of its area | <p>Woodland structure includes variations in age, tree form, layering, the distribution and abundance of open space and dead wood. It plays a critical role in woodland ecosystem functioning.</p> <p>The targets set within this attribute reflect the most appropriate structure for the woodland feature on a particular site, taking account of its known interest, history, past management and the landscape context. Having some open, sunlit and largely tree-less areas as part of the woodland community is often important to facilitate natural tree and shrub regeneration and also to provide supporting habitat for specialist woodland invertebrates, birds, vascular and lower plants.</p> | This attribute will be periodically monitored as part of Natural England's site condition assessments |
| Structure and function (including its typical species) | Old growth | Maintain the extent and continuity of undisturbed, mature/old growth stands (typically comprising at least 20% of the feature at any one time) and the assemblages of veteran and ancient trees (typically >10 trees per hectare). | <p>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 wind-throw/fire/tree falling over/snow damage.</p> <p>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> | This attribute will be periodically monitored as part of Natural England's site condition assessments |
| Structure and function (including its typical species) | Dead and decaying wood | Maintain the continuity and abundance of standing or fallen dead and decaying wood, typically between 30 - 50m ³ per hectare of standing or fallen timber or 3-5 fallen trees >30cm per hectare, and | 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. | This attribute will be periodically monitored as part of Natural England's site condition |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|------------------------------------|--|---|---|
| | | >10 standing dead trees per hectare | | assessments |
| Structure and function (including its typical species) | Tree 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. | This attribute will be periodically monitored as part of Natural England's site condition assessments |
| | Shrub layer | Maintain an understorey shrubs covering between 20 - 60% of the stand area (this will vary with light levels and site objectives) | Woodland structure includes variations in age, tree form, layering, the distribution and abundance of open space and dead wood. It plays a critical role in woodland ecosystem functioning. The targets set within this attribute should reflect the most appropriate structure for the woodland feature on a particular site, taking account of its known interest, history, past management and the landscape context. | This attribute will be periodically monitored as part of Natural England's site condition assessments |
| | 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. Intensively-managed grasslands / arable land could potentially not allow this gradation of woodland edge and could have other impacts on the integrity of the site (pollution/ nutrient enrichment etc). | This attribute will be periodically monitored as part of Natural England's site condition assessments |
| | Adaptation and resilience | Restore the resilience of the feature by ensuring a diversity (at least 2 species) of site-native trees (e.g pedunculate oak, birch, and holly) across the site. | This recognises the increasing likelihood of natural habitat features needing to absorb or adapt to wider environmental changes. Resilience may be described as the ability of an ecological system to cope with, and adapt to environmental stress and change whilst retaining the same basic structure and ways of functioning. Such environmental changes may include changes in sea levels, precipitation and temperature for example, which are likely to affect the extent, distribution, composition and functioning of a feature within a site. The vulnerability and response of features to such changes will vary. In | This attribute will be periodically monitored as part of Natural England's site condition assessments |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|---|--|---|---|
| | | | <p>general terms, the relative sensitivity of the H91A0 feature to climate change is considered to be moderate. 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) level that allows a well-developed understorey within the H91A0 feature | <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.</p> <p>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>Indicators of suitably-low levels of grazing will be no obvious browse line, a lush ground vegetation with some grazing-sensitive species evident and tree seedlings and sapling present under canopy gaps.</p> | This attribute will be periodically monitored as part of Natural England's site condition assessments |
| Structure and function (including its typical species) | Regeneration potential | Maintain the potential for sufficient natural regeneration of site-native trees and shrubs; typically tree seedlings of desirable species (measured by seedlings and <1.3m saplings - above grazing and browsing height) should be visible in sufficient numbers in gaps, at the wood edge and/or as regrowth as appropriate ; | <p>The regeneration potential of the woodland feature must be maintained if the wood is to be sustained and survive, both in terms of quantity of regeneration and in terms of appropriate species. This will include regeneration of the trees and shrubs from saplings or suckers, regrowth from coppice stools or pollards, and where appropriate planting.</p> <p>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 taking place.</p> | This attribute will be periodically monitored as part of Natural England's site condition assessments |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|---|---|---|---|
| Structure and function (including its typical species) | Tree and shrub species composition | Maintain a canopy and under-storey of which 95% is composed of site native trees and shrubs | 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). | This attribute will be periodically monitored as part of Natural England's site condition assessments |
| Structure and function (including its typical species) | Key structural, influential and/or distinctive species | <p>Maintain the abundance of the species listed below to enable each of them to be a viable component of the H91A0 habitat;</p> <p>Tree species: <i>Quercus robur</i>, <i>Ilex aquifolium</i>, Assemblage of woodland mosses including <i>Dicranum</i> spp. <i>Hylocomium splendens</i>, <i>Rhytidiadelphus loreus</i>, <i>Pluerozium schreberi</i>, <i>Plagiothecium undulatum</i>, <i>Thuidium tamarascinum</i>, <i>Polytrichum formosum</i>, <i>Usnea</i> spp. Assemblage of woodland lichens including:- <i>Mycoblastis affinis</i>, <i>Usnea filipendula</i>, <i>Sphaerophorus melanocarpus</i>, <i>Arthonia stellaris</i>, <i>Micaria botyroides</i>, <i>M. cinerea</i>, <i>M. violacea</i>, <i>Gyalideopsis muscicola</i>, <i>Bryoria smithii</i>, <i>Massalongia carnosa</i>, <i>Ochrolechia tartarea</i>, <i>Pilophorus strumaticus</i> and <i>Parmelia discordans</i>.</p> | See supporting notes for this attribute in Table 1 above. | This attribute will be periodically monitored as part of Natural England's site condition assessments |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|---|--|--|---|
| | | <p>Filmy ferns: <i>Hymenophellum</i> spp.</p> <p>Lichens <i>Bryoria smithii</i> (which grows on Oak tree trunks in Wistman's Wood and Blackator Copse)</p> <p><i>Parmelia disscordans</i> which is found on boulders between the copse and the crags of Blackator (the only known English site for this species)</p> | | |
| Structure and function (including its typical species) | Invasive, non-native and/or introduced species | Ensure invasive and introduced non-native species are either rare or absent, but if present are causing minimal damage to the H91A0 feature | <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, snowberry, Japanese knotweed, giant hogweed and Himalayan balsam, for example. Similarly, this would include pheasants, rabbits and non-native invertebrate 'pest' species.</p> | This attribute will be periodically monitored as part of Natural England's site condition assessments |
| Structure and function (including its typical species) | Soils, substrate and nutrient cycling | Maintain the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungal: bacterial ratio, to within typical values for the H91A0 habitat. | Soil is the foundation of basic ecosystem function and a vital part of the natural environment. Its properties strongly influence the colonisation, growth and distribution of those plant species which together form vegetation types, and therefore provides a habitat used by a wide range of organisms. Soil biodiversity has a vital role to recycle organic matter. Changes to natural soil properties may therefore affect the ecological structure, function and processes associated with this Annex I feature. | |
| Structure and function (including its typical species) | 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- | 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. | |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|---------------------|--|---|---|
| species) | | compacted condition | The condition of the soil surrounding such trees will affect their roots, associated mycorrhizal fungi and growth. Plants have difficulty in compacted soil because the mineral grains are pressed together, leaving little space for air and water which are essential for root growth. Unless carefully managed, activities such as construction, forestry management and trampling by grazing livestock and human feet during recreational activity may all contribute to excessive soil compaction around ancient trees. | |
| Supporting processes (on which the feature relies) | Air quality | Restore as necessary the concentrations and deposition of air pollutants to below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System www.apis.ac.uk | See the supporting notes for this attribute in Table 1 above. | More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System www.apis.ac.uk |
| Supporting processes (on which the feature relies) | Hydrology | At a site, unit and/or catchment level (as necessary, maintain natural hydrological processes to provide the conditions necessary to sustain the feature within the site | Defining and maintaining the appropriate hydrological regime is a key step in moving towards achieving the conservation objectives for this site and sustaining this feature. Changes in source, depth, duration, frequency, magnitude and timing of water supply can have significant implications for the assemblage of characteristic plants and animals present. Hydrological functioning is important for humidity for lower plants. | |
| Supporting processes (on which the feature relies) | Illumination | Ensure artificial light is maintained to a level which is unlikely to affect natural phenological cycles and processes to the detriment of the H91A0 feature and its typical species at this site. | Woodland biodiversity has naturally evolved with natural patterns of light and darkness, so disturbance or modification of those patterns can influence numerous aspects of plant and animal behaviour. 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. | |

| Attributes | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|--|---------|-------------------------------------|--------------------------------|
| Version Control Advice last updated: N/A | | | |
| Variations from national feature-framework of integrity-guidance: References to <i>Quercus petraea</i> changed to <i>Q. robur</i> since this is the dominant species at the site | | | |

Table 5: Supplementary Advice for Qualifying Features: S1044 Southern damselfly *Coenagrion mercuriale*

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|------------------------------------|-----------------------------|---|--|--|
| Population (of the feature) | Population abundance | Maintain the abundance of the Southern Damselfly population at a level which is above 100 individuals, whilst avoiding deterioration from its current level as indicated by the latest mean peak count 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.</p> <p>Due to the dynamic nature of population change, the target-value given for the population size or presence of this feature is considered to be the minimum standard for conservation/ restoration measures to achieve. This minimum-value may be revised where there is evidence to show that a population's size or presence has significantly changed as a result of natural factors or management measures and has been stable at or above a new level over a considerable period. The values given here may also be updated in future to reflect any strategic objectives which may be set at a national level for this feature.</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 possible, local Natural England staff can advise that the figures stated are the best available.</p> | <p>BOYCE (2017)</p> <p>DARTMOOR NATIONAL PARK AUTHORITY (2013)</p> |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|--|---|---|--|--------------------------------|
| Supporting habitat: extent and distribution | Distribution of supporting habitat | Restore the distribution and continuity of the feature and its supporting habitat, including where applicable its component vegetation types and associated transitional vegetation types, across the site | <p>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.</p> <p>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.</p> | |
| Supporting habitat: extent and distribution | Extent of supporting habitat | Restore the total extent of the habitats which support the feature: wet heath, dry heath and blanket bog | <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.</p> <p>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> | |
| Supporting habitat: structure/function | Substrate: Base-rich runnels and heathland seepages/streams | Maintain >50% cover of peat or other organic substrate in watercourse/mire. | The preferred supporting habitat substrate is an inorganic substrate overlaid with shallow organic peat or silt | |
| Supporting habitat: structure/function | Trophic conditions: Base-rich runnels and heathland seepages/streams | Maintain dystrophic to mesotrophic conditions as indicated by a lack of areas of watercourse with encroachment of algae (except brown flocculent algae), bacterial film or invasive tall emergents such as <i>Juncus effusus</i> , <i>J. acutiflorus</i> and <i>Phragmites</i> spp. | <p>A wide range of pH is found in watercourses on southern damselfly sites, although the majority of sites fall within the range 7.0–7.5.</p> <p>These conditions ensure sufficient oxygen for larval and egg development and no eutrophication and encroachment of invasive emergents and algae.</p> | |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|---|--|--|--------------------------------|
| Supporting habitat: structure/function | Vegetation composition: Base-rich runnels and heathland seepages/streams | Maintain stream lengths with a good cover of submerged and semi-emergent, herbaceous macrophytes including some cover of <i>Hypericum elodes</i> , <i>Potamogeton polygonifolius</i> , or <i>Ranunculus flammula</i> , with some <i>Carex</i> spp. or <i>Juncus</i> spp. | <p>The southern damselfly usually emerges from the water as final instar larvae by ascending emergent vegetation, rather than by walking onto shore. Tall rushes and sedges are known to have been used and emergence perches for the southern damselfly include semi-emergent plants such as lesser water parsnip (<i>Berula erecta</i>), bittersweet (<i>Solanum dulcamara</i>), water mint (<i>Mentha aquatica</i>) and watercress (<i>Rorippa nasturtium-aquaticum</i>).</p> <p>Ideal emergence perches are likely to be plants with rigid stems that would not bend in the wind. The damselfly's wings and abdomen were less likely to be damaged if they did not touch surrounding vegetation during expansion and drying. The eggs are laid into water plant tissue and plant species used as oviposition substrates. Key species on Dartmoor include water mint (<i>Mentha aquatica</i>), marsh St John's wort (<i>Hypericum elodes</i>), bog pondweed (<i>Potamogeton polygonifolius</i>) and jointed rush (<i>Juncus articulatus</i>).</p> | |
| Supporting habitat: structure/function | Scrub cover | Maintain only small areas of tall scrub or trees within 20 metres of watercourse or mire but not on intervening habitat between two areas of population. | Some scattered trees and scrub associated with base-rich runnels and heathland seepages/streams can provide areas for roosting, maturation, feeding, displaying and basking. | |
| Supporting habitat: structure/function | Emergent and bankside vegetation | Maintain, and in places, restore an abundance of emergent and fringing vegetation of reeds, grasses and herbs i.e. free of scrub and tree regeneration and little bare ground. | <p>The abundance of emergent and bankside vegetation is usually maintained through extensive grazing with cattle. Such grazing needs to be amended so that water course fringes are clear of scrub but not overly poached.</p> <p>The use of moderate grazing regimes should reduce the establishment of scrub and invading emergents on most sites. Grazing by heavier animals, such as cattle and horses, is generally preferred as this causes some poaching of watercourse margins and can create the diversity of tussock structure preferred by the southern damselfly.</p> | |
| Supporting habitat: structure/function | Flow: base-rich runnels and heathland seepages/streams | Maintain open, unshaded, shallow lengths of watercourse/mire with a permanent discernible flow (approx. 10 cm s ⁻¹). | The southern damselfly requires base-rich, shallow streams with a constant slow-to-moderate permanent flow and relatively high water temperature. | |
| Supporting habitat: structure/function | Nutrient status: | Maintain phosphate concentrations at less than 0.025 mg l ⁻¹ | Phosphate concentration is generally less than 0.025 mg l ⁻¹ in most watercourses occupied by the southern damselfly in England. | |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|---|--|---|---|
| function | | | | |
| Supporting habitat: structure/function | Trophic conditions: Base-rich runnels and heathland seepages/streams | Maintain dystrophic to mesotrophic conditions indicated by a lack of areas of watercourse with encroachment of algae (except brown flocculent algae), bacterial film or invasive tall emergents such as <i>Juncus effusus</i> , <i>J. acutiflorus</i> and <i>Phragmites</i> spp. | A wide range of pH is found in watercourses on southern damselfly sites, although the majority of sites fall within the range 7.0–7.5. These conditions ensure sufficient oxygen for larval and egg development and no eutrophication and encroachment of invasive emergents and algae. | |
| Supporting processes (on which the feature and/or its supporting habitat relies) | Conservation measures | Restore] the management measures (either within and/or outside the site boundary as appropriate) which are necessary to Restore] the structure, functions and supporting processes associated with the feature and/or its supporting habitats. | Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site. Further details about the necessary conservation measures for this site can be provided by contacting Natural England. This information will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, site management strategies or plans, the Views about Management Statement for the underpinning SSSI and/or management agreements. The Southern Damselfly has very particular habitat requirements for a mid-successional management dependent habitat. It is important to ensure that sites holding Southern Damselfly populations are managed according to these requirements, as well as potentially suitable adjacent land. Due to their limited dispersal ability, only small areas of the watercourse should be managed in any one year. In addition, potentially suitable areas close to existing populations or between current populations can be managed to reconnect them. | BRITISH DRAGONFLY SOCIETY (2016) – Southern Damselfly Management Handbook |
| Version Control | | | | |
| Advice last updated: 26 February 2010. Following stakeholder comments, additional reference added (Boyce, 2017) and list of key plant species made more specific to Dartmoor. | | | | |
| Variations from national feature-framework of integrity-guidance: None | | | | |

Table 6: Supplementary Advice for Qualifying Features: S1106 Atlantic salmon *Salmo salar*

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|------------------------------------|------------------------------|---|---|--------------------------------|
| Population (of the feature) | Adult run size | Restore the Atlantic Salmon population to that expected under un-impacted conditions, allowing for natural fluctuations. | <p>Impacts on physical, chemical or hydrological integrity, or from non-native species, or from exploitation in freshwater or marine and coastal waters, may suppress adult run size. Stocking may also artificially augment adult run size, and may mask environmental problems or generate impacts on naturally spawned individuals.</p> <p>This should include a seasonal pattern of migration characteristic of the river and maintenance of the multi-sea-winter component.</p> <p>As a minimum, the Conservation Limit for the river system should be complied with. This should be based on the adult run size required to fully utilise all parts of the catchment that would be suitable for spawning and juvenile development under un-impacted conditions.</p> | |
| Population (of the feature) | Juvenile densities | Restore juvenile densities of Atlantic Salmon at those expected under unimpacted conditions throughout the site, taking into account natural habitat conditions and allowing for natural fluctuations | Impacts on physical, chemical or hydrological integrity, or from non-native species, or from exploitation of spawning adults in freshwater or marine and coastal waters, may suppress juvenile densities. | |
| Population (of the feature) | Spawning distribution | Restore the distribution of spawning activity to reflect un-impacted conditions through the site, and avoid reductions in existing levels. | <p>After a year or more at sea, adult Atlantic salmon return from their feeding grounds back to their river. Once it is time for them to spawn they will migrate upstream to the areas of the SAC where they were born to spawn themselves. These spawning areas may be in small tributaries of river systems where there is clean gravel and a good flow of fresh clean water.</p> <p>Maintaining these spawning areas is critical to the successful reproduction and long-term viability of this feature.</p> | |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|--|---|---|--|--------------------------------|
| Supporting habitat: extent and distribution | Distribution of supporting habitat | Maintain the distribution and continuity of Atlantic Salmon and its supporting habitat, including where applicable its component vegetation types and associated transitional vegetation types, across the site | <p>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.</p> <p>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.</p> | |
| Supporting habitat: extent and distribution | Extent of supporting habitat | Maintain the total extent of the habitat which supports Atlantic Salmon at approximately 6km of suitable watercourses. | <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.</p> <p>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> | . |
| Supporting habitat: structure/function | Biological connectivity | Ensure the natural movement of Atlantic Salmon through the SAC is not artificially constrained. | Freedom of movement throughout the river system is critical to all life stages of salmon. Barriers to adult migration have cumulative effects on the ability of individuals to reach spawning grounds and need to be considered in combination. | |
| Supporting habitat: structure/function | Flow regime | Maintain, and in places, restore the natural flow regime of the river, with daily flows as close to what would be expected in the absence of abstractions and discharges (the naturalised flow). | The natural flow regime is critical to all aspects of the salmon life cycle, including migratory passage through the estuary and up the river to spawning grounds, egg incubation in redds, fry and parr habitat quality and extent, and downstream smolt migration. | |
| Supporting habitat: structure/function | Invasive, non-native and/or introduced species | Ensure non-native species categorised as 'high-impact' in the UK under the Water Framework Directive are either rare or absent but if present are causing minimal damage to Atlantic Salmon | Species such as signal crayfish can have a serious effect on salmon habitat and can predate heavily on salmon juveniles if present at high densities. Chinese mitten crab has the potential to migrate long distances up rivers and damage marginal habitats used by both adult and juvenile salmon. | |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|----------------------------------|--|---|--------------------------------|
| Supporting habitat: structure/function | Riparian zone | Maintain, and in places, restore a patchy mosaic of natural woody and herbaceous (tall and short swards) riparian vegetation (except in upland areas above the natural tree line). | High riparian tree cover is beneficial to salmon, in terms of physical habitat provision and combatting increasing temperatures caused by climate change. However, the extent of tree cover needs to be optimised to provide suitable conditions for the whole characteristic biological community. The riparian zone should be sufficiently wide to act as a healthy and functional habitat zone within the river corridor. | |
| Supporting habitat: structure/function | Sediment regime | Maintain, and in places, restore the natural supply of coarse and fine sediment to the river | Natural levels of coarse sediment supply are critical to the maintenance of high quality juvenile and salmon habitat, maintaining spawning gravels and characteristic biotope mosaics. Excessive delivery of fine sediment, from the catchment or artificially enhanced bank erosion, can damage fish gills, impair vision and cause siltation of spawning and nursery areas. | |
| Supporting habitat: structure/function | Supporting habitat mosaic | Maintain, and in places, restore the extent and pattern of in-channel and riparian biotopes (habitats) to that characteristic of natural fluvial processes | Within the river, a characteristic habitat mosaic shaped by natural processes provides the diversity of water depths, current velocities and substrate types necessary to fulfil the spawning, juvenile, adult and migratory requirements of salmon as well as other characteristic species. Some river sections will be naturally sub-optimal for some salmon life stages, and this is just a characteristic of the river. The species requires a combination of in-channel habitat: <ul style="list-style-type: none"> • adult holding areas (generally pools of at least 150 cm depth, with cover from features such as undercut banks, vegetation, submerged objects and surface turbulence), • spawning habitat (stable, clean gravel/pebble-dominated substrate without an armoured layer and with <10% fines in the top 30cm, and with 15-75cm of overlying water) • nursery habitat (for fry, water of <20 cm deep and a gravel/pebble/cobble substrate; for parr, water 20-40 cm deep and similar substrate) | |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|--------------------------------------|---|---|--------------------------------|
| | | | Close juxtaposition of biotopes is needed to allow easy movement of individuals between suitable areas of the channel under different flow conditions and with age. | |
| Supporting habitat: structure/function | Thermal regime | Maintain, and in places, restore a natural thermal regime to the river subject to a changing climate, ensuring that water temperatures should not be significantly artificially elevated | Water temperature can affect egg development, fish survival, feeding and growth. Atlantic salmon is considered particularly vulnerable to increasing temperatures in the southern part of its English range, most notably in chalk streams. It is now known that higher sea and river temperatures may be affecting salmon survival and migration in some years. Summer temperatures are reaching levels that may reduce the quality of eggs that female salmon produce and be directly impacting on parr survival. They may also be inhibiting migration into the river and increasing the mortality of adult salmonids. | |
| Supporting habitat: structure/function | Water quality - acidification | Maintain levels of acidity to those which reflect un-impacted conditions Acid Neutralising Capacity (ANC) and pH to meet targets for high ecological status under the WFD | Salmon are highly sensitive to acidification stress. | |
| Supporting habitat: structure/function | Water quality - nutrients | Restore the natural nutrient regime of the river, with any anthropogenic enrichment above natural/background concentrations limited to levels at which adverse effects on Atlantic salmon are unlikely. | In addition to the wider ecosystem effects of eutrophication that have a detrimental effect on salmon habitat, nutrient enrichment can place salmon at a competitive disadvantage, for instance relative to brown trout. Salmon are efficient foragers that are adapted to low productivity environments, and increased productivity makes efficient foraging obsolete. Eutrophication and episodic pollution causes direct fish mortalities, whilst chronic pollution affects substrate condition through the build-up of excessive microbial populations. Salmon are particularly sensitive to reduced dissolved oxygen levels in the water column and within the gravel substrate of spawning redds (nests). | |
| Supporting habitat: structure/function | Woody debris | Maintain, and in places, restore the presence of coarse woody debris within the structure of the channel | Woody debris is an important component of river habitat for salmon as well as the wider biological community. | |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|----------------------------------|--|--|--|
| | | (except in upland areas above the natural tree line). In smaller watercourses, temporary debris dams should be a feature of channel dynamics. | | |
| Supporting processes (on which the feature and/or its supporting habitat relies) | Adaptation and resilience | Maintain the feature's ability, and that of its supporting habitat, to adapt or evolve to wider environmental change, either within or external to the site | See relevant text in Table 1. | |
| 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 Atlantic Salmon and/or its supporting habitats. | Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site. Further details about the necessary conservation measures for this site can be provided by contacting Natural England. This information will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, site management strategies or plans, the Views about Management Statement for the underpinning SSSI and/or management agreements. | NATURAL ENGLAND, 2014. Site Improvement Plan: Dartmoor (SIP054) CODLING, I.D., MISTRY, R.M., SOLOMON, D., & MASON, S. (2004) ENVIRONMENT AGENCY (2003) |
| Supporting processes (on which the feature and/or its supporting habitat relies) | Fisheries - exploitation | Ensure exploitation (e.g. netting or angling) of Atlantic salmon is undertaken sustainably without compromising any components of the population, including multi-sea winter fish and seasonal components of the adult run. | Controls on exploitation should take account of migratory passage within territorial waters, including estuarine and coastal net fisheries, as well as exploitation within the river from rod fisheries Voluntary and statutory provisions are in place to help protect salmon | |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|---|---|---|--------------------------------|
| Supporting processes (on which the feature and/or its supporting habitat relies) | Fisheries - introduction of non-native salmon and other fish species | Ensure fish stocking/introductions do not interfere with the ability of the river to support self-sustaining populations of Atlantic Salmon | <p>The aim is to provide conditions in the river that support a healthy, natural and self-sustaining salmon population, achieved through habitat protection/restoration and managed exploitation as necessary. The presence of artificially high densities of other fish creates unacceptably high levels of predatory and competitive pressure on juvenile salmon.</p> <p>Stocking represents a loss of naturalness and, if successful, obscures the underlying causes of poor performance (potentially allowing these risks to perpetuate). It carries various ecological risks, including the loss of natural spawning from broodstock, competition between stocked and naturally produced individuals, disease introduction and genetic alterations to the population</p> | |
| Supporting processes (on which the feature and/or its supporting habitat relies) | Integrity of off-site habitats | Restore any supporting habitat present beyond the site boundary upon which Atlantic Salmon of the SAC depend | <p>As mobile species, Atlantic Salmon populations are dependent on the integrity of sections of river channel, riparian areas, and transitional and marine waters that lie outside of the site boundary. Headwater areas and tributaries may not fall within the site boundary, yet salmon may use these areas for spawning and juvenile development and be critical for sustaining populations within the site.</p> <p>Fully developed riparian zones are essential for salmon habitat, yet part of this zone may lie outside of the site boundary, particularly if the river channel is operating under natural processes and moves laterally over time within the floodplain.</p> <p>The conditions experienced by salmon on their marine migration (through the saline transition zone, estuary, coastal waters and into the high seas) are also likely to be critical to the well-being of populations within the river, and vice versa.</p> | |
| Supporting processes (on which the feature and/or its supporting habitat relies) | Screening of intakes and discharges | Ensure all intakes and discharges likely to trap a significant number of individuals are being adequately screened. | Salmon can be seriously affected by inadequate screening on their adult and smolt migrations, as well as on their smaller juvenile dispersion movements between spawning grounds and nursery areas. | |

| Attributes | | Targets | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|---------------------------------------|--|--|--------------------------------|
| Supporting processes (on which the feature and/or its supporting habitat relies) | Cover of submerged macrophytes | Maintain, and in places, restore a sufficient proportion of all aquatic macrophytes to allow them to reproduce in suitable habitat and unaffected by river management practices. | In rivers where it naturally occurs, submerged and marginal vegetation is an important element of juvenile salmon habitat. | |
| Version Control Advice last updated: n/a | | | | |
| Variations from national feature-framework of integrity-guidance: None | | | | |

Table 7: Supplementary Advice for Qualifying Features: S1355 Otter *Lutra lutra*

| Attributes | | Target | Supporting and/or explanatory notes | Sources of site-based evidence |
|------------------------------------|--------------------------------|--|--|--------------------------------|
| 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 Otter 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.</p> <p>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> | DEVON MAMMAL GROUP, 2015. |
| 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.</p> <p>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. 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>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</p> | |

| Attributes | | Target | Supporting and/or explanatory notes | Sources of site-based evidence |
|--|---|--|---|---|
| | | | 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. | |
| Supporting habitat: extent and distribution | Distribution of supporting habitat | Restore the distribution and continuity of supporting habitat for Otter, including where applicable its component vegetation types and associated transitional vegetation types, across the site | See supporting notes for this attribute in table 6 above. | CODLING, I.D., MISTRY, R.M., SOLOMON, D., & MASON, S. (2004): Site characterisation of the Dartmoor cSAC and associated rivers for the purposes of the review of consents project DEVON MAMMAL GROUP, 2015. Otters in Devon. Accessed at http://www.devonmammalgroup.org/devons-mammals/otter/ |
| Supporting habitat: extent and distribution | Extent of supporting habitat | Maintain the total extent of the habitat which support Otter at approximately 1% of the site or 2300ha | 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. | JNCC, 1996. NATURA 2000 STANDARD DATA FORM |

| Attributes | | Target | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|---|---|---|--------------------------------|
| | | | | |
| Supporting habitat: structure/function | Abundance of breeding and resting places | Maintain an abundance of natural breeding and resting sites for Otter within the siteSAC | <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 will often need to use many dens or 'holts' at any one time. They may give birth in one, but raise their young in another.</p> <p>Some natal den structures have a limited lifespan (e.g. hollow tree trunks, piles of timber) and if alternative opportunities for natal dens are limited, suitable replacements can be created or constructed. Maintaining a dense cover of bankside vegetation will ensure that there are suitable areas for above-ground resting couches.</p> <p>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. Otters are a European protected species, and it is an offence to disturb their resting places.</p> | |
| Supporting habitat: structure/function | Availability of refugia | Restore an abundance of dense bankside vegetation to limit significant disturbance to Otters | <p>For rivers, most of the floodplain is outside the boundary of the site, yet the integrity of the interest feature will often be dependent upon the quality of the adjacent habitat out-with the boundary of the site.</p> <p>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> | |
| Supporting habitat: structure/function | Food availability | Restore fish biomass within expected natural levels for the supporting habitat (subject to natural fluctuations). | In freshwater, key fish prey sources for otters include eels, salmonids, roach and sticklebacks. 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 water bird (young coots, moorhens, ducks) or mammal (rabbits, water voles - although this is uncommon). The diet of coastal otters may include eelpout, rockling, butterfish, lumpsuckers and an occasional crab. | |

| Attributes | | Target | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|--|--|--|--------------------------------|
| | | | <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 gravel pits on a floodplain. 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 | Restore the quality of supporting river habitat features, based on the advice for H3260 habitat, based on natural river function, which provides a characteristic habitat mosaic that caters for otters. | <p>Good quality habitat associated with river systems, such as dense bankside vegetation, riparian trees and roots, marshes and reedbeds, are all important for otters.</p> <p>Dense bankside vegetation and reed-beds are favoured as above-ground resting places or 'couches' but otters will often travel some distance to preferred sites which may be away from the edge of the river.</p> <p>The underground root systems of waterside trees such as oak, ash and sycamore provide important underground dens or 'holts' used by otters to rest and shelter. Mature trees, particularly those with well-developed root systems, leaning trunks and overhanging branches provide ideal holt sites. Ash trees and sycamore trees are important sites for otter holts as both have shallow spreading roots which make ideal roofs for holts</p> <p>The structure and quality of bankside vegetation, reed-beds and other nearby habitats should be maintained and enhanced, particularly where there is evidence of use by otters. However, it is thought that the most significant determinant of otter use of a habitat is the abundance of prey.</p> | |
| Supporting habitat: structure/function | Water flow [rivers] | Restore 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 Otter 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. | |

| Attributes | | Target | Supporting and/or explanatory notes | Sources of site-based evidence |
|---|----------------------------------|---|---|---|
| Supporting habitat: structure/function | Water quality/ quantity | Restore water quality and quantity to a standard which provides the necessary conditions to support the feature Otter i.e. Water Framework Directive good ecological status | <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.</p> <p>Further site-specific investigations may be required to establish appropriate standards for the SAC. The main impact of water quality 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 to them. 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> | ENVIRONMENT AGENCY. (2011 a, b, c, d, e, f) |
| Supporting processes (on which the feature and/or its supporting habitat relies) | Adaptation and resilience | Restore the feature's ability, and that of its supporting habitat, to adapt or evolve to wider environmental change, either within or external to the site | See supporting notes for this attribute in Table 1 above. | |

| Attributes | | Target | Supporting and/or explanatory notes | Sources of site-based evidence |
|--|-------------------------------------|--|--|---|
| 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 SAC | <p>Barriers to movement such as roads and weirs can generally increase the risk of harm to Otters as they traverse or avoid them. If these barriers are considered a problem then mitigating measures could be taken.</p> <p>Otter populations within the SAC are dependent on the integrity of whole sections of river channel, riparian areas, freshwater still-waters, floodplains and transitional and marine waters that lie outside of the site boundary. These may not fall within the designated site boundary, yet otters may use these areas for feeding and these will be critical for sustaining populations within the site. It is possible that holts that are used by the SAC's Otter population may lie on the adjacent floodplain out with the boundary of the SAC.</p> | DEVON MAMMAL GROUP, 2015. |
| Supporting processes (on which the feature and/or its supporting habitat relies) | Conservation measures | Restore the management measures (either within and/or outside the site boundary as appropriate) which are necessary to restore the structure, functions and supporting processes associated with Otter and/or its supporting habitats. | <p>Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site.</p> <p>Further details about the necessary conservation measures for this site can be provided by contacting Natural England. This information will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, site management strategies or plans, the Views about Management Statement for the underpinning SSSI and/or management agreements.</p> | NATURAL ENGLAND, 2014. Site Improvement Plan: Dartmoor (SIP054) |
| 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. | |
| Version Control Advice last updated: n/a | | | | |
| Variations from national feature-framework of integrity-guidance: Attributes for <i>Habitat quality [coastal sites]: Freshwater availability</i> and <i>Habitat quality - coastal habitat</i> removed as that habitat is not present within the SAC | | | | |

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