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

## Breney Common and Goss and Tregoss Moors Special Area of Conservation (SAC) Site Code: UK0030098

Photo credit: Natural England

## Date of Publication: 20 March 2019

# About this document

This document provides Natural England's supplementary advice about the European Site Conservation Objectives relating to Breney Common and Goss and Tregoss Moors SAC. This advice should therefore be read together with the SAC Conservation Objectives available here.

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

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

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

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

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

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

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

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

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

# About this site

## European Site information

| | |
|---|---|
| **Name of European Site** | Breney Common and Goss and Tregoss Moors Special Area of Conservation (SAC) |
| **Location** | Cornwall |
| **Site Map** | The designated boundary of this site can be viewed here on the MAGiC website |
| **Designation Date** | 1 April 2005 |
| **Qualifying Features** | See section below |
| **Designation Area** | 816.01 ha |
| **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)** | Mid Cornwall Moors<br><br>The SAC was previously underpinned by two SSSIs: Breney Common and Goss and Tregoss Moors. These sites have recently been superseded by the Mid Cornwall Moors SSSI which was notified in 2017. The Mid Cornwall Moors SSSI includes the majority of the area of these previously notified SSSIs; however a number of small areas (totalling less than 9 ha) have also been de-notified because they are no longer considered to be of special interest, and so these parts of the SAC are no longer underpinned by an SSSI.<br><br>15 units of Mid Cornwall Moors are within the SAC (4, 8, 9, 10, 11, 12, 14, 15, 16, 17, 18, 19, 20, 21, 35) |
| **Relationship with other European or International Site designations** | N/A. |

## Site background and geography

Breney Common and Goss and Tregoss Moors SAC is located in mid Cornwall. As its name suggests, it is comprised of two discrete parts – Breney Common, which lies 7 km north-west of St Austell, and Goss and Tregoss Moors, which lies approximately 5 km to the south of Bodmin. Goss and Tregoss Moors is just over 6 km east of Breney Common. The majority of the site falls within the Hensbarrow National Character Area (NCA 154), with a small section of the north of Breney Common within the Cornish Killas NCA (NCA 152). The majority of Goss and Tregoss Moors is within Goss Moor National Nature Reserve.

The site is underlain predominantly by calcareous slate, grits, shales and thin limestones of the Lower Devonian Mead-foot beds. This bedrock is overlain by extensive granite gravels with well drained, gritty loam soils rich in organic matter on higher ground and alluvial deposits along stream valleys giving rise to peaty acidic soil.

Much of the site has been subject to past disturbance as a result of extensive tin streaming, gravel extraction and peat cutting. Evidence of this can be seen in the hummock-hollow complex, series of ditches and other workings found throughout the site, which has a markedly undulating micro-topography. Past soil disturbance and the influence of calcareous bedrock has resulted in a diverse range of wetland areas on low-lying ground with extensive tracts of wet woodland, ponds in various stages of succession, acid bog communities, valley mire and fen communities and, on higher ground, large tracts of dry and wet heath, acid grassland and drier woodland communities.

This mosaic of habitats supports many plants and animals, including a range of rare and scarce flowering plants and ferns, invertebrates, breeding willow tits *Poecile montanus* and internationally important meta-populations of marsh fritillary butterflies *Euphydryas aurinia*, which requires a network of suitable habitat patches sufficiently close to one another to allow re-colonisation.

# 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:

- **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.

Northern Atlantic wet heaths with *Erica tetralix* are restricted to the Atlantic fringe of Europe between Norway and Normandy. A high proportion of the EU resource occurs in the UK. Northern Atlantic wet heaths with *Erica tetralix* occur throughout the UK but are highly localised in parts of southern and central England. Wet heaths become increasingly extensive in the cool and wet north and west, especially in the Scottish Highlands. However, the area covered by wet heath is significantly smaller than that covered by 7130 Blanket bogs or 4030 European dry heaths.

In the UK this vegetation corresponds to the following NVC types:

- H5 *Erica vagans – Schoenus nigricans* heath
- M14 *Schoenus nigricans – Narthecium ossifragum* mire
- M15 *Scirpus cespitosus – Erica tetralix* wet heath
- M16 *Erica tetralix – Sphagnum compactum* wet heath

M15 *Scirpus – Erica* wet heath is found in areas with a moderate to high rainfall, and is the typical form of wet heath in the north and west of the UK. *E. tetralix* and *Calluna* are typically accompanied by abundant deergrass *Trichophorum cespitosum* and purple moor-grass *Molinia caerulea*.

M16 *Erica – Sphagnum* wet heath is characteristic of drier climates in the south and east, and is usually dominated by mixtures of *E. tetralix*, *Calluna* and *Molinia*. The bog-moss *Sphagnum compactum* is typically abundant. In the south, species with a mainly southern distribution in Britain, such as marsh gentian *Gentiana pneumonanthe*, brown beak-sedge *Rhynchospora fusca* and meadow thistle *Cirsium dissectum*, enrich wet heaths.

A very local wet heath type is M14 *Schoenus – Narthecium* mire, which is mainly associated with transitions from heath to valley bog at a small number of lowland sites in southern Britain.

Wet heath is an important habitat for a range of vascular plant and bryophyte species of an oceanic or Atlantic distribution in Europe, several of which have an important part of their EU and world distribution in the UK. Northern Atlantic wet heaths with *Erica tetralix* are restricted to the Atlantic fringe of Europe between Norway and Normandy. A high proportion of the EU resource occurs in the UK.

This lowland site exhibits mosaics of various habitats, including 4030 European dry heaths, wet heaths, acid grassland, bog, swamp, fen and open water communities. The soil-structure reflects past mining operations, which has caused poor drainage. The resulting extensive wet communities include the localised M14 *Schoenus nigricans - Narthecium ossifragum* mire, closely associated with M25 *Molinia caerulea - Potentilla erecta* mire. There are several species of bog-mosses *Sphagnum* spp., bog asphodel *Narthecium ossifragum*, orchids and some nationally scarce plants, such as yellow centaury *Cicendia filiformis*, marsh clubmoss *Lycopodiella inundata* and pillwort *Pilularia globulifera*. The habitat supports rich assemblages of invertebrates including the Annex II species 1065 marsh fritillary *Euphydryas aurinia*.

- **H4030 European dry heaths**

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

This habitat has a wide European distribution, but it is only extensive in the western oceanic fringes of Europe, including the UK. Dry heaths occur throughout the UK. They are particularly abundant in the uplands, where they may form extensive stands, which dominate the landscape. They are more localised in lowland areas, especially in south and central England, where they have declined in extent due to afforestation, agricultural improvement and other land uses. Lowland heaths in southern Britain often support an important fauna, including birds (such as European nightjar *Caprimulgus europaeus* and Dartford warbler *Sylvia undata*), reptiles (such as sand lizard *Lacerta agilis* and smooth snake *Coronella austriaca*) and invertebrates.

Dry heaths vary in their flora and fauna according to climate, and are also influenced by altitude, aspect, soil conditions (especially base-status and drainage), maritime influence, and grazing and burning intensity. There is a gradation from southerly to northerly kinds of dry heath, and there are also both western (oceanic) and eastern (more continental) forms.

On slightly damp soils in the mild, oceanic climate of south-west England and south Wales, there is the uncommon H4 *Ulex– Agrostis* heath, characterised by the frequency of bristle bent *Agrostis curtisii* and western gorse *Ulex gallii*, alongside *Calluna*, bell heather *Erica cinerea* and cross-leaved heath *E. tetralix*. The rare Dorset heath *E. ciliaris* and Cornish heath *E. vagans* are found locally in this community.

At low to moderate altitudes in warm oceanic parts of southern Britain, the typical form of the habitat is H8 *Calluna – Ulex* heath, characterised by abundant *Calluna*, *U. gallii* and *E. cinerea*.

*U. gallii* becomes scarce in the cooler oceanic climate further north, where *E. cinerea* and *Calluna* are abundant together in H10 *Calluna – Erica* heath, especially on more southerly-facing slopes; *E. cinerea* becomes dominant in the hyper-oceanic fringes of the north-west.

Both Breney Common and Goss and Tregoss Moors support extensive stands of dry heath. The dominant dry heath found on the site most closely resembles H4 western gorse *Ulex gallii* – bristle bent *Agrostis curtisii*[1] heath with H4a bristle bent *Agrostis curtisii* - bell heather *Erica cinerea* sub-community occurring on areas of drier ground. This sub-community has a marked increase in abundance of western gorse, bell heather and heather *Calluna vulgaris*. A higher frequency of cross-leaved heath *Erica tetralix,* purple moor-grass *Molinia caerulea* and deergrass *Trichophorum germanicum* is found in the H4c cross-leaved heath sub-community and wetter H4d deergrass sub-community.

Areas resembling H8 heather *Calluna vulgaris* – western gorse *Ulex gallii* heath, H10 heather *Calluna vulgaris* – bell heather *Erica cinerea* heath and H1 heather *Calluna vulgaris* – sheep's fescue *Festuca ovina* heath are also present in smaller stands on drier hummocks and on low Cornish hedges/banks dividing areas of swamp and marshy grassland. The H8 community contains abundant western gorse.

- **H7140 Transition mires and quaking bogs; 'Very wet mires often identified by an unstable 'quaking' surface''**

The term 'transition mire' relates to vegetation that in floristic composition and general ecological characteristics is transitional between acid bog and 7230 Alkaline fens, in which the surface conditions range from markedly acidic to slightly base-rich. The vegetation normally has intimate mixtures of species considered to be acidophile and others thought of as calciphile or basophile. In some cases the

mire occupies a physically transitional location between bog and fen vegetation, as for example on the marginal lagg of raised bog or associated with certain valley and basin mires. In other cases these intermediate properties may reflect the actual process of succession, as peat accumulates in groundwater-fed fen or open water to produce rainwater-fed bog isolated from groundwater influence. Many of these systems are very unstable underfoot and can therefore also be described as 'quaking bogs'.

Transition mires and quaking bogs can occur in a variety of situations, related to different geomorphological processes: in flood plain mires, valley bogs, basin mires and the lagg zone of raised bogs, and as regeneration surfaces within mires that have been cut-over for peat or areas of mineral soil influence within 7130 Blanket bogs (e.g. ladder fens).

The following NVC types form the core of 7140 Transition mires and quaking bog vegetation in the UK:

- M4 *Carex rostrata – Sphagnum recurvum* mire
- M5 *Carex rostrata – Sphagnum squarrosum* mire
- M8 *Carex rostrata – Sphagnum warnstorfii* mire
- M9 *Carex rostrata – Calliergon cuspidatum/giganteum* mire
- M21 *Narthecium ossifragum – Sphagnum papillosum* valley mire
- S27 *Carex rostrata – Potentilla palustre* tall-herb fen.

However, this list is not exhaustive: forms of M2 *Sphagnum cuspidatum/recurvum* bog pool community, M14 *Schoenus nigricans – Narthecium ossifragum* mire and M29 *Hypericum elodes – Potamogeton polygonifolius* soakway are also important components on some sites. The inclusion of some types of M21 (which is explicitly excluded by the JNCC (Annex 1) definition), particularly those that have developed hydroserally from fen, and those that include transitions to soakaway communities such as M14 fits well with sites found within the SAC and therefore is also considered to form part of this vegetation type. Not all examples of M9 *Carex – Calliergon* mire belong to this Annex I type; where it occurs in more base-rich conditions or in association with other rich fen communities, it may be referable to 7230 Alkaline fens, or, in stands where great fen-sedge *Cladium mariscus* is dominant, to 7210 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*.

Transition mires and quaking bogs have a wide European distribution but appear to be relatively scarce in the Mediterranean region. They are a widespread but local habitat type in the UK that is ecologically variable and occurs in a wide range of geomorphological contexts.

Although possibly the site of a former raised bog, this site lying either side of the A30 trunk road and encompassing the River Fal is now recovering from an intensive period of china clay and gravel extraction. H7140 Transition mire has developed in the hollows between ridges and mounds on which dry heathland forms a mosaic with acid grassland. Wet heath merges into *Sphagnum*-dominated fen vegetation with common cottongrass *Eriophorum angustifolium*, round-leaved sundew *Drosera rotundifolia*, bog-myrtle *Myrica gale*, bog asphodel *Narthecium ossifragum*, black bog-rush *Schoenus nigricans* and bog pimpernel *Anagallis tenella*. Of particular note are the nationally scarce plants yellow centaury *Cicendia filiformis*, marsh clubmoss *Lycopodiella inundata* and pillwort *Pilularia globulifera*.

Emergent vegetation around the 15 ponds includes water horsetail *Equisetum fluviatile*, bogbean *Menyanthes trifoliata* and marsh cinquefoil *Comarum palustre*. Many of the transitions include tall fen vegetation with bulrush *Typha latifolia*, common reed *Phragmites australis* and bottle sedge *Carex rostrata*. Other wetland plants found in the pond margins and across the more shallow ponds include marsh St John's-wort *Hypericum elodes*, sharp-flowered rush *Juncus acutiflorus* and ivy-leaved bellflower *Wahlenbergia hederacea*. Of particular note are the nationally scarce Cornish moneywort *Sibthorpia europaea* and wavy St John's-wort *Hypericum undulatum*. Extensive willow carr has developed over much of the central part of the Goss Moor.

## Qualifying Species:

- **S1065 Marsh fritillary butterfly *Euphydryas* (*Eurodryas*, *Hypodryas*) *aurinia***

The marsh fritillary butterfly *Euphydryas aurinia* is found in a range of habitats in which its larval food plant, devil's-bit scabious *Succisa pratensis*, occurs. Marsh fritillaries are essentially grassland butterflies in the UK, and although populations may occur occasionally on wet heath, bog margins and woodland clearings, most colonies are found in damp acidic or dry calcareous grasslands. In Northern Ireland it occurs in fens and on sand dunes. Management in both wet and dry situations is predominantly by low-intensity cattle or pony grazing. Sheep selectively graze devil's-bit scabious and are therefore detrimental to marsh fritillary populations, except at very low stocking rates. Burning and mowing are also known to have caused the extinction of populations.

Populations of marsh fritillary vary greatly in size from year to year, and, at least in part, this is related to cycles of attack from parasitic wasps. Adults tend to be sedentary and remain in a series of linked meta-populations, forming numerous temporary sub-populations, which frequently die out and recolonise. Where unable to do this, populations do not seem to be able to persist in habitat fragments. It is therefore essential to conserve a cluster of sites in close proximity.

The marsh fritillary has declined dramatically in Europe and is regarded as endangered or vulnerable in most of its European range. On the basis of existing knowledge, the UK and Spain constitute the European strongholds for this species. Although formerly widespread in central and eastern England, it is now mainly confined to western and northern parts of the UK. It has become extinct over a large part of its former range, having declined by about 55% since records began. The species continues to be vulnerable in many parts of its range. Important centres of distribution are in south-west England (particularly Devon, Dorset and Wiltshire), south and west Wales, and western Scotland.

This dramatic decline is mirrored in Cornwall, with 62% of known populations going extinct between 1990 and 2000. These trends have caused the butterfly to contract to a handful of core geographical areas one of these being a set of sub-populations (temporary populations as part of a meta-population) found across the Mid Cornwall Moors.

Breney Common and Goss and Tregoss Moors form part of the Mid Cornwall Moors and either support or have historically supported a cluster of three marsh fritillary sub-populations within this site's meta-population. The Mid Cornwall Moors meta-population is an important westerly stronghold for the species and is the only population found within the Cornish Killas NCA and Hensbarow NCA. It has declined from more coastal areas in Cornwall, where only a small number of diminishing colonies remain, including one in the Lizard NCA where it can be found on extensive areas of maritime cliff grassland at Mullion Cliff to Predannack Cliff SSSI, approximately 52 km to the south-west of Mid Cornwall Moors. One population exists in the Bodmin Moor NCA on acidic grassland associated with the Bodmin Moor North SSSI, approximately 24 km to the north-east of Mid Cornwall Moors. As such the marsh fritillary meta-population of the Mid Cornwall Moors SSSI is considered to be of strategic importance for the conservation of this species across its current UK range and is especially significant within a Cornish context.

## Table 1: Supplementary Advice for Qualifying Features: H4010. Northern Atlantic wet heaths with *Erica tetralix*; 'Wet heathland with cross-leaved heath'

<table>
<tr><th colspan="2">Attributes</th><th>Targets</th><th>Supporting and Explanatory Notes</th><th>Sources of site-based evidence (where available)</th></tr>
<tr><td>Extent and distribution of the feature</td><td>Extent of the feature within the site</td><td>Restore the total extent of the feature to at least 24ha</td><td>There should be no measurable reduction (excluding any trivial loss) in the extent and area of this feature, and in some cases, the full extent of the feature may need to be restored. The baseline-value of extent given has been generated using data gathered from the listed site-based surveys. Area measurements given may be approximate depending on the methods, age and accuracy of data collection, and as a result this value may be updated in future to reflect more accurate information.<br><br>The extent of an Annex I habitat feature covers the sum extent of all of the component vegetation communities present and may include transitions and mosaics with other closely-associated habitat features. Where a feature is susceptible to natural dynamic processes, there may be acceptable variations in its extent through natural fluctuations.<br><br>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.<br><br>There is currently approximately 24 ha of H4010 wet heath on the site. This target will be reviewed following the completion of the Growing Goss project.<br><br><table><tr><th>NVC</th><th>Area</th></tr><tr><td>M14*</td><td>5.64</td></tr><tr><td>M15</td><td>15.92</td></tr><tr><td>M16</td><td>2.20</td></tr><tr><td>Heath (no NVC)</td><td>0.38</td></tr><tr><td>Total</td><td>24.13</td></tr></table></td><td>Records of site condition assessments.<br><br>NATURAL ENGLAND 2005 – 2015. National Vegetation Classification GIS data. Available from Natural England on request.<br><br>Goss and Tregoss Moors SSSI NVC Survey, 2006. Report to Mid Cornwall Moors LIFE Project, English Nature<br><br>Helman Tor Nature Reserve Management Plan 2008 – 2013. A report to Cornwall Wildlife Trust, 2007. CEC Ltd, 2007<br><br>Analysis of Mid Cornwall Moors NVC data. Unpublished Report. Natural England. 2009. Available from Natural England on request<br><br>NATURAL ENGLAND. 2014. Breney Common and Goss and Tregoss Moors Site Improvement Plan v1.0 Natural England. Available at: http://publications.naturalengland.org.uk/publication/4613474239905792<br><br>Mid Cornwall Moors NVC and CSM Survey, 2015. A report to Natural England, Osmunda</td></tr>
</table>

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| | | | *M14 can form part H7140 transition mire as well as of H4010 wet heath. The mapped area of M14 has not been fully partitioned between these two SAC features so the total area of M14 on the site is given.<br><br>Target set to Restore because gorse, scrub and bracken have encroached on a number of areas of wet heath. The extent target will be reviewed once the long term objective for the mix of scrub and heath on site have been developed. | Ecology<br><br>NATURAL ENGLAND. 2017. *Mid Cornwall Moors SSSI Supporting Information. A supplement to the notification document.* Natural England. Available from Natural England on request.<br><br>NATURAL ENGLAND. 2017. *A Statement of Natural England's Views about the Management of Mid Cornwall Moors Site of Special Scientific Interest (SSSI)*. Natural England. Available at: https://designatedsites.naturalengland.org.uk/PDFsForWeb/VAM/2000707.pdf<br><br>NATURAL ENGLAND. 2018. *Mid Cornwall Moors SSSI Favourable Condition Table. Consultation Draft - May 2018.* Natural England. Available from Natural England on request.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Extent and distribution of the feature** | **Spatial distribution of the feature within the site** | Restore the distribution and configuration of the feature, including where applicable its component vegetation types, across the site | A contraction in the range, or geographic spread, of the feature (and its component vegetation and typical species, plus transitional communities) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. This may also reduce and break up the continuity of a habitat within a site and how well its typical species are able to move around the site to occupy and use habitat. Such fragmentation can impact on their viability | See sources of site based evidence listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| | | | and 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.<br><br>Target set to Restore because gorse, scrub and bracken have encroached on a number of areas of wet heath. | |
| **Structure and function (including its typical species)** | **Vegetation community transitions** | Restore any areas of transition between this and communities which form other heathland-associated habitats, such as dry and humid heaths, mires, acid grasslands, scrub and woodland. | Transitions/zonations between adjacent but different vegetation communities are usually related to naturally-occurring changes in soil, aspect or slope. Such 'ecotones' retain characteristics of each bordering community and can add value in often containing species not found in the adjacent communities. Retaining such transitions can provide further diversity to the habitat feature, and support additional flora and fauna. This is an important attribute as many characteristic heathland species utilise the transitions between vegetation types or use different vegetation types during different stages of their life cycle.<br><br>Target set to Restore because gorse, scrub and bracken have encroached on a number of areas of wet heath and the transitions to other communities. | See sources of site based evidence listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Structure and function (including its typical species)** | **Vegetation community composition** | Ensure the component vegetation communities of the feature are referable to and characterised by the following National Vegetation Classification types.<br><br>M14 - *Schoenus nigricans* - *Narthecium ossifragum* mire<br>M15 - *Trichophorum germanicum* - *Erica tetralix* wet heath | This habitat feature will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management. In the UK these have been categorised by the National Vegetation Classification (NVC).<br><br>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 | See sources of site based evidence listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| | | M16 - *Erica tetralix* - *Sphagnum compactum* wet heath | and preferential species of a community), and therefore that of the SAC feature, at appropriate levels (recognising natural fluctuations). | |
| **Structure and function (including its typical species)** | **Vegetation structure: cover of dwarf shrubs** | Maintain an overall cover of dwarf shrub species which is typically between 40-90% | Variations in the structure of the heathland vegetation (vegetation height, amount of canopy closure, and patch structure) is needed to maintain high niche diversity and hence high species richness of characteristic heathland plants and animals. Many species also utilise the transitions between vegetation types or use different vegetation types during different stages of their life cycle. The structural character of the heathland feature is strongly influenced by the growing habits of its dominant species which in most cases will be ericoids (i.e. plants that look like heathers, including members of the Ericaceae and Empetraceae families).<br><br>The ericaceous species heather or ling *Calluna vulgaris*, bell heather *Erica cinerea*, cross-leaved heath *Erica tetralix*, Dorset heath *Erica ciliaris*, Cornish heath *Erica vagans*, bilberry or blaeberry *Vaccinium myrtillus* and cowberry *Vaccinium vitis-idaea* are the commonest and most characteristic dwarf-shrubs. Hybrids of Dorset and crossleaved heath and of bilberry and cowberry can be locally abundant. *Calluna* is usually the most abundant. Crowberry *Empetrum nigrum*, another common species in some coastal and transitional heaths, is not strictly ericaceous but is often treated as an ericoid species. | NATURAL ENGLAND. 2018. *Mid Cornwall Moors SSSI Favourable Condition Table. Consultation Draft - May 2018.* Natural England. Available from Natural England on request<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Structure and function (including its typical species)** | **Vegetation structure: heather age structure** | Restore a diverse age structure amongst the ericaceous shrubs typically found on the site | Each phase of growth associated with the characteristic heathers which dominate this feature also represents different microclimatic conditions and microhabitats which may provide shelter or food to other organisms. Therefore, it is important to maintain a mosaic of heather in different phases of growth. Typically this age structure will consist of between 10-40% cover of (pseudo) pioneer heathers; 20-80% cover of building/mature heathers; <30% cover of degenerate heathers and less than <10% cover of dead heathers.<br><br>Target set to Restore because low grazing levels have resulted in a reduction in structural diversity. | NATURAL ENGLAND. 2014. *Breney Common and Goss and Tregoss Moors Site Improvement Plan v1.0* Natural England. Available at: http://publications.naturalengland.org.uk/publication/4613474239905792<br><br>NATURAL ENGLAND. 2018. *Mid Cornwall Moors SSSI Favourable Condition Table.* |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| | | | | *Consultation Draft - May 2018.* Natural England. Available from Natural England on request.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Structure and function (including its typical species)** | **Vegetation structure: cover of gorse** | Total *Ulex* spp. cover <50%, with *Ulex europaeus* <25%. | Gorse as a component of heathland is a very valuable wildlife habitat, and often a marker of relict heath and common. Both dense and spiny, it provides good, protected cover for many wildlife species: birds, mammals and reptiles; breeding habitat for rare or declining bird species, and excellent winter roosting. The flowers, borne at a time of year when other sources of pollen or nectar are in short supply, are particularly good for insects and other invertebrate pollinators. However gorse may cause problems if unchecked by dominating an area, eliminating other typical heathland species. Mature stands en masse may also be serious fire hazards.<br><br>Gorse has encroached onto some stands of wet heath and needs to be reduced in extent. | See sources of site based evidence listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Structure and function (including its typical species)** | **Vegetation structure: tree cover** | Restore the open character of the feature, with a typically scattered and low cover of trees and scrub (<15% cover) | 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. 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.<br><br>Target set to Restore because scrub has encroached on a number of areas of wet heath. | See sources of site based evidence listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| **Structure and function (including its typical species)** | **Vegetation composition : Bracken cover** | Restore a cover of dense bracken which is low, typically at <10% | The spread of bracken *Pteridium aquilinum* is a problem on many lowland heathlands. The unpalatable nature and density of bracken as a tall-herb fern, and its decomposing litter, can smother and shade out smaller and more characteristic heathland vegetation. Usually active management of bracken is required to reduce or contain its cover across this habitat feature. But this fern has also some nature conservation value, for example on sites where fritillary butterflies occur and utilise bracken litter habitat.<br><br>Target set to Restore because bracken has encroached on a number of areas of wet heath. | See sources of site based evidence listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Structure and function (including its typical species)** | **Key structural, influential and/or distinctive species** | Restore the abundance of the species listed to enable each of them to be a viable component of the Annex I habitat feature.<br><br>The constant and preferential plants of the M14, M15 and M16 NVC community type which forms a key component of the SAC habitats that is present.<br><br>Vascular plan assemblage including *Illecebrum verticillatum,* Coral Necklace; Baldellia ranunculoides, Lesser Water-plantain; *Centunculus minimus*, Chaffweed; *Chamaemelum nobile,* Chamomile; *Platanthera bifolia,* Lesser Butterfly-orchid; *Radiola linoides* Allseed; *Euphrasia vigursii*, Eyebright.<br><br>*Hydrochus nitidicollis* Gravel water beetle | 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;<br><br>• **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').<br><br>• **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)<br><br>• **Site-distinctive** species which are considered to be a particularly special and distinguishing component of an Annex I habitat on a particular SAC.<br><br>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.<br><br>The list of species given here for this Annex I habitat feature at | See sources of site based evidence listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| | | *Omphiscola glabra* Pond mud snail | 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.<br><br>Target set to Restore because a number of populations of these species have been reduced/lost due to encroachment of scrub and a reduction in structural diversity (resulting from insufficient/inappropriate grazing). | |
| **Structure and function (including its typical species)** | **Vegetation: undesirable species** | Maintain the frequency/cover of the following undesirable species to within acceptable levels and prevent changes in surface condition, soils, nutrient levels or hydrology which may encourage their spread. | Undesirable non-woody and woody vascular plants species may require active management to avert an unwanted succession to a different and less desirable state. Often they may be indicative of a negative trend relating to another aspect of a site's structure and function. These species will vary depending on the nature of the particular feature, and in some cases these species may be natural/acceptable components or even dominants.<br><br>Invasive non-natives should be eradicated if possible.<br><br>Undesirable species include: *Apium nodiflorum* Fool's water-cress; *Chamerion angustifolium* Rosebay willowherb; *Cirsium arvense* Creeping Thistle; *Cirsium vulgare* Spear thistle; *Epilobium* spp. Willowherbs (excluding *E. palustre* Marsh willowherb); *Fallopia japonica* Japanese knotweed; *Glyceria fluitans* Floating sweet-grass; *Juncus effusus* Soft Rush; *Juncus squarrosus* Heath Rush; *Oenanthe crocata* Hemlock water-dropwort; *Phragmites australis* Common reed; *Ranunculus* spp. Buttercups; *Rumex obtusifolius* Broad-leaved dock; *Rumex crispus* Curled dock; *Senecio* spp. Ragworts; *Typha* spp Bulrushes; *Urtica dioica* Common nettle; 'coarse grasses'.<br><br>Native species in this list may be beneficial for a range of invertebrates and only become indicators of negative quality if they are over the established limit. | See sources of site based evidence listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Structure and function (including its** | **Functional connectivity with wider** | Restore the overall extent, quality and function of any supporting features within the local | 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 | See sources of site based evidence listed above. |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| **typical species)** | **landscape** | landscape which provide a critical functional connection with the site | 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.<br><br>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.<br><br>Approximately half of Mid Cornwall Moors SSSI is within Breney Common and Goss and Tregoss Moors SAC, with the remainder close to the SAC. The areas of SSSI outside of the SAC support a range of semi-natural vegetation types, including extensive areas of wet heath.<br><br>Target set to Restore because these patches of wet heath are fragmented, e.g. by roads and intensive agriculture. | This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Structure and function (including its typical species)** | **Adaptation and resilience** | Restore the feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site | This recognises the increasing likelihood of natural habitat features to absorb or adapt to wider environmental changes. Resilience may be described as the ability of an ecological system to cope with, and adapt to environmental stress and change whilst retaining the same basic structure and ways of functioning. Such environmental changes may include changes in sea levels, precipitation and temperature for example, which are likely to affect the extent, distribution, composition and functioning of a feature within a site. The vulnerability and response of features to such changes will vary. Using best available information, any necessary or likely adaptation or adjustment by the feature and its management in response to actual or expected climatic change should be allowed for, as far as practicable, in order to ensure the | NATURAL ENGLAND. 2014. *Breney Common and Goss and Tregoss Moors Site Improvement Plan v1.0* Natural England. Available at: http://publications.naturalengland.org.uk/publication/4613474239905792<br><br>NATURAL ENGLAND, 2015. *Climate Change Theme Plan and supporting National Biodiversity Climate Change Vulnerability assessments ('NBCCVAs') for* |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| | | | feature's long-term viability.<br><br>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. This means that this site is considered to be vulnerable overall but moderately so. This means that some adaptation action for specific issues may be required, 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.<br><br>Target set to Restore because the Breney Common and Goss and Tregoss Moors are fragmented, in particular by roads and intensive agriculture. | *SACs and SPAs in England.* Natural England. Available at: http://publications.naturalengland.org.uk/publication/4954594591375360 |
| **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 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.<br><br>Target set to Restore because some areas of wet heath (both within and outside the SAC) require scrub control and/or changes to grazing to reduce scrub extent and restore structural diversity. | NATURAL ENGLAND. 2014. *Breney Common and Goss and Tregoss Moors Site Improvement Plan v1.0* Natural England. Available at: http://publications.naturalengland.org.uk/publication/4613474239905792<br><br>NATURAL ENGLAND. 2017. *A statement of Natural England's views about the management of Mid Cornwall Moors Site of Special Scientific Interest (SSSI)*. Natural England. Available at: https://designatedsites.naturalengland.org.uk/PDFsForWeb/VAM/2000707.pdf<br><br>This attribute will be periodically |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| | | | | monitored as part of Natural England's SSSI Condition Assessments |
| **Supporting processes (on which the feature relies)** | **Soils, substrate and nutrient cycling** | Maintain the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungal: bacterial ratio, to within typical values for the habitat. | Soil is the foundation of basic ecosystem function and a vital part of the natural environment. Its properties strongly influence the colonisation, growth and distribution of those plant species which together form vegetation types, and therefore provides a habitat used by a wide range of organisms. Soil biodiversity has a vital role to recycle organic matter. Changes to natural soil properties may therefore affect the ecological structure, function and processes associated with this Annex I feature. This Annex 1 habitat has essentially raw soils with little humus and low nutrient status. | National Soil Map of England and Wales – NATMAP<br>See:<br>http://www.landis.org.uk/data/natmap.cfm) |
| **Supporting processes (on which the feature relies)** | **Air quality** | Restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk). | 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.<br><br>Critical Loads and Levels are recognised thresholds below which such harmful effects on sensitive UK habitats will not occur to a significant level, according to current levels of scientific understanding. There are critical levels for ammonia (NH3), oxides of nitrogen (NOx) and sulphur dioxide (SO2), and critical loads for nutrient nitrogen deposition and acid deposition. There are currently no critical loads or levels for other pollutants such as Halogens, Heavy Metals, POPs, VOCs or Dusts. These should be considered as appropriate on a case-by-case basis.<br><br>Ground level ozone is regionally important as a toxic air pollutant but flux-based critical levels for the protection of semi-natural habitats are still under development. It is recognised that achieving this target may be subject to the development, availability and effectiveness of abatement technology and measures to tackle diffuse air pollution, within realistic timescales. | More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk ). |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| | | | Target set to Restore because both nitrogen and acid deposition currently exceed their critical loads. | |
| **Supporting processes (on which the feature relies)** | **Water quality** | Where the feature is dependent on surface water and/or groundwater, restore water quality and quantity to a standard which provides the necessary conditions to support the feature. | 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.<br><br>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.<br><br>Target set to Restore because both internal and external drains are reducing the water supply to the wet heath. It is also likely that evapotranspiration from invading scrub is further reducing the water supply.<br><br>The water supply mechanisms of the site are not fully understood and a hydrological study is required. | NATURAL ENGLAND. 2014. *Breney Common and Goss and Tregoss Moors Site Improvement Plan v1.0* Natural England. Available at: http://publications.naturalengland.org.uk/publication/4613474239905792<br><br>NATURAL ENGLAND. 2017. *A statement of Natural England's views about the management of Mid Cornwall Moors Site of Special Scientific Interest (SSSI)*. Natural England. Available at: https://designatedsites.naturalengland.org.uk/PDFsForWeb/VAM/2000707.pdf<br><br>NATURAL ENGLAND. 2018. *Mid Cornwall Moors SSSI Favourable Condition Table. Consultation Draft - May 2018.* Natural England. Available from Natural England on request<br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Supporting processes (on which the feature relies)** | **Hydrology** | At a site, unit and/or catchment level (as necessary) restore the natural hydrological regime 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. This | NATURAL ENGLAND. 2014. *Breney Common and Goss and Tregoss Moors Site Improvement Plan v1.0* Natural England. Available at: http://publications.naturalengland. |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| | | | target is generic and further site-specific investigations may be required to fully inform conservation measures and/or the likelihood of impacts.<br><br>Target set to Restore because both internal and external drains are disrupting the hydrology of the site. It is also likely that evapotranspiration from invading scrub is further reducing the water supply.<br><br>On a catchment scale, the headwaters of the River Fal are heavily modified, which is impacting the natural hydrological regime. Opportunities for re-naturalising this part of the catchment should be investigated. | org.uk/publication/4613474239905792<br><br>NATURAL ENGLAND. 2017. *A statement of Natural England's views about the management of Mid Cornwall Moors Site of Special Scientific Interest (SSSI)*. Natural England. Available at: https://designatedsites.naturalengland.org.uk/PDFsForWeb/VAM/2000707.pdf |
| **Version Control**<br>Advice last updated: N/A | | | | |
| **Variations from national feature-framework of integrity-guidance**: N/A<br><br>**Rationale for changes to site specific targets -** In some cases (particularly cover of *Ulex europaeus* and bracken, and for some of the positive and negative indicator species) targets for wet and dry heath have been amalgamated. This means some deviation from the CSM generic standards, but has the advantages of a more succinct table and facilitates the monitoring of wet and dry heath types combined which could be advantageous given that both types frequently occur in intimate mosaics within the same management or monitoring unit. The higher targets have been adopted here on the basis that the large scale of the site, habitat dynamism and the landscape-scale mosaic of habitat types lends itself to a higher tolerance of scrub, bracken, etc. | | | | |

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

<table>
<tr><th colspan="2">Attributes</th><th>Targets</th><th>Supporting and Explanatory Notes</th><th>Sources of site-based evidence (where available)</th></tr>
<tr><td>Extent and distribution of the feature</td><td>Extent of the feature within the site</td><td>Restore the total extent of the feature to at least 88ha, whilst accepting no deterioration from current levels.<br><br>This target will be reviewed following the completion of the Growing Goss project.</td><td>There should be no measurable reduction (excluding any trivial loss) in the extent and area of this feature, and in some cases, the full extent of the feature may need to be restored. The baseline-value of extent given has been generated using data gathered from the listed site-based surveys. Area measurements given may be approximate depending on the methods, age and accuracy of data collection, and as a result this value may be updated in future to reflect more accurate information.<br><br>The extent of an Annex I habitat feature covers the sum extent of all of the component vegetation communities present and may include transitions and mosaics with other closely-associated habitat features. Where a feature is susceptible to natural dynamic processes, there may be acceptable variations in its extent through natural fluctuations.<br><br>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.<br><br>There is currently approximately 88 ha of H4030 European dry heath on the site:<br><br><table><tr><th>NVC</th><th>Area (ha)</th></tr><tr><td>H4</td><td>83.83</td></tr><tr><td>H8</td><td>3.79</td></tr><tr><td>H10</td><td>0.33</td></tr><tr><td>Heath (no NVC)</td><td>0.38</td></tr><tr><td>Total</td><td>88.32</td></tr></table><br>Target set to Restore because gorse, scrub and bracken have encroached on a number of areas of dry heath. The extent</td><td>See sources of site based evidence for this attribute, associated with H4010 wet heath, listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments</td></tr>
</table>

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| | | | target will be reviewed once the long term objective for the mix of scrub and heath on site have been developed. | |
| **Extent and distribution of the feature** | **Spatial distribution of the feature within the site** | Restore the distribution and configuration of the feature, including where applicable its component vegetation types, across the site | A contraction in the range, or geographic spread, of the feature (and its component vegetation and typical species, plus transitional communities) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. This may also reduce and break up the continuity of a habitat within a site and how well its typical species are able to move around the site to occupy and use habitat. Such fragmentation can impact on their viability and the wider ecological composition of the Annex I habitat. Smaller fragments of habitat can typically support smaller and more isolated populations which are more vulnerable to extinction. These fragments also have a greater amount of open edge habitat which will differ in the amount of light, temperature, wind, and even noise that it receives compared to its interior. These conditions may not be suitable for some of the typical and more specialist species associated with the Annex I habitat feature.<br><br>Target set to Restore because gorse, scrub and bracken have encroached on a number of areas of dry heath. | See sources of site based evidence for this attribute, associated with H4010 wet heath, listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Structure and function (including its typical species)** | **Vegetation community composition** | Ensure the component vegetation communities of the feature are referable to and characterised by the following National Vegetation Classification types:<br><br>H4 - *Ulex gallii - Agrostis curtisii* heath<br><br>H8 - *Calluna vulgaris - Ulex gallii* heath<br>H10 - *Calluna vulgaris - Erica cinerea* heath | This habitat feature will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management. In the UK these have been categorised by the National Vegetation Classification (NVC).<br><br>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). | See sources of site based evidence for this attribute, associated with H4010 wet heath, listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| **Structure and function (including its typical species)** | **Vegetation community transitions** | Restore any areas of transition between this and communities which form other heathland-associated habitats, such as dry and humid heaths, mires, acid grasslands, scrub and woodland. | Transitions/zonations between adjacent but different vegetation communities are usually related to naturally-occurring changes in soil, aspect or slope. Such 'ecotones' retain characteristics of each bordering community and can add value in often containing species not found in the adjacent communities.<br><br>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.<br><br>Target set to Restore because gorse, scrub and bracken have encroached on a number of areas of dry heath and the transitions to other communities. | See sources of site based evidence for this attribute, associated with H4010 wet heath, listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Structure and function (including its typical species)** | **Vegetation structure: cover of dwarf shrubs** | Maintain an overall cover of dwarf shrub species which is typically between 40-70% | Variations in the structure of the heathland vegetation (vegetation height, amount of canopy closure, and patch structure) is needed to maintain high niche diversity and hence high species richness of characteristic heathland plants and animals. Many species also utilise the transitions between vegetation types or use different vegetation types during different stages of their life cycle.<br><br>The structural character of the heathland feature is strongly influenced by the growing habits of its dominant species which in most cases will be ericoids (i.e. plants that look like heathers, including members of the Ericaceae and Empetraceae families). The ericaceous species heather or ling *Calluna vulgaris*, bell heather *Erica cinerea*, cross-leaved heath *Erica tetralix*, Dorset heath *Erica ciliaris*, Cornish heath *Erica vagans*, bilberry or blaeberry *Vaccinium myrtillus* and cowberry *Vaccinium vitis-idaea* are the commonest and most characteristic dwarf-shrubs. Hybrids of Dorset and cross leaved heath and of bilberry and cowberry can be locally abundant. *Calluna* is usually the most abundant. Crowberry *Empetrum nigrum*, another common species in some coastal and transitional heaths, is not strictly ericaceous but is often treated as an ericoid species. | See sources of site based evidence for this attribute, associated with H4010 wet heath, listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| **Structure and function (including its typical species)** | **Vegetation composition: bracken cover** | Restore a cover of dense bracken which is low, typically at <10% | The spread of bracken *Pteridium aquilinum* is a problem on many lowland heathlands. The unpalatable nature and density of bracken as a tall-herb fern, and its decomposing litter, can smother and shade out smaller and more characteristic heathland vegetation. Usually active management of bracken is required to reduce or contain its cover across this habitat feature. But this fern has also some nature conservation value, for example on sites where fritillary butterflies occur and utilise bracken litter habitat.<br><br>Target set to Restore because bracken has encroached on a number of areas of dry heath. | See sources of site based evidence for this attribute, associated with H4010 wet heath, listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Structure and function (including its typical species)** | **Vegetation structure: cover of gorse** | Restore cover of common gorse *Ulex europaeus* at <25% and the combined cover of *U. europaeus* and *U. gallii* at <50% | Gorse as a component of heathland is a very valuable wildlife habitat, and often a marker of relict heath and common. Both dense and spiny, it provides good, protected cover for many wildlife species: birds, mammals and reptiles; breeding habitat for rare or declining bird species, and excellent winter roosting. The flowers, borne at a time of year when other sources of pollen or nectar are in short supply, are particularly good for insects and other invertebrate pollinators.<br><br>However gorse may cause problems if unchecked by dominating an area, eliminating other typical heathland species. Mature stands en masse may also be serious fire hazards.<br><br>Target set to Restore because gorse has encroached on a number of areas of dry heath. | See sources of site based evidence for this attribute, associated with H4010 wet heath, listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Structure and function (including its typical species)** | **Vegetation structure: tree cover** | Restore the open character of the feature, with a typically scattered and low cover of trees and scrub (<15% cover) | Scrub (mainly trees or tree saplings above 1 m in height) and isolated trees are usually very important in providing warmth, shelter, cover, foodplants, perches, territorial markers and sources of prey for typical heathland invertebrates and vertebrates. But overall cover of scrub and trees across this habitat feature should be maintained or restored to a fairly sparse level, with a structurally complex edge and with characteristic heathland vegetation as ground cover. If scrub is locally important for any associated species with their own | See sources of site based evidence for this attribute, associated with H4010 wet heath, listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| | | | 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.<br><br>Target set to Restore because scrub has encroached on a number of areas of dry heath. | |
| **Structure and function (including its typical species)** | **Vegetation structure: heather age structure** | Restore a diverse age structure amongst the ericacerous shrubs typically found on the site. | Each phase of growth associated with the characteristic heathers which dominate this feature also represents different microclimatic conditions and microhabitats which may provide shelter or food to other organisms. Therefore, it is important to maintain a mosaic of heather in different phases of growth. Typically this age structure will consist of between 10-40% cover of (pseudo) pioneer heathers; 20-80% cover of building/mature heathers; <30% cover of degenerate heathers and less than <10% cover of dead heathers.<br><br>Target set to Restore because low grazing levels have resulted in a reduction in structural diversity. | See sources of site based evidence for this attribute, associated with H4010 wet heath, listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Structure and function (including its typical species)** | **Vegetation: undesirable species** | 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: | Undesirable non-woody and woody vascular plants species may require active management to avert an unwanted succession to a different and less desirable state. Often they may be indicative of a negative trend relating to another aspect of a site's structure and function. These species will vary depending on the nature of the particular feature, and in some cases these species may be natural/acceptable components or even dominants.<br><br>Undesirable species include: All invasive non-native species; *Apium nodiflorum* Fool's water-cress; *Chamerion angustifolium* Rosebay willowherb; *Cirsium arvense* Creeping Thistle; *Cirsium vulgare* Spear thistle; *Epilobium* spp. Willowherbs (excl. *E. palustre* Marsh willowherb); *allopia japonica* Japanese knotweed; *Glyceria fluitans* Floating sweet-grass; *Juncus effusus* Soft Rush; *Juncus squarrosus* Heath Rush; *Oenanthe crocata* Hemlock water-dropwort; *Phragmites australis* Common reed; *Ranunculus* spp. Buttercups; *Rumex obtusifolius* Broad-leaved dock; *Rumex crispus* Curled dock; | See sources of site based evidence for this attribute, associated with H4010 wet heath, listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| | | | *Senecio* spp. Ragworts; *Typha* spp Bulrushes; *Urtica dioica* Common nettle; 'coarse grasses' | |
| **Structure and function (including its typical species)** | **Key structural, influential and/or distinctive species** | Restore the abundance of the species listed to enable each of them to be a viable component of the Annex I habitat feature.<br><br>The constant and preferential plants of the H4, H8 and H10 NVC community type which forms a key component of the SAC habitats that is present<br><br>Vascular plan assemblage including *Illecebrum verticillatum,* Coral Necklace; Baldellia ranunculoides, Lesser Water-plantain; *Centunculus minimus*, Chaffweed; *Chamaemelum nobile,* Chamomile; *Platanthera bifolia,* Lesser Butterfly-orchid; *Radiola linoides* Allseed; *Euphrasia vigursii*, Eyebright | 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;<br><br>• **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').<br><br>• **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)<br><br>• **Site-distinctive** species which are considered to be a particularly special and distinguishing component of an Annex I habitat on a particular SAC.<br><br>There may be natural fluctuations in the frequency and cover of each of these species. The relative contribution made by them to the overall ecological integrity of a site may vary, and Natural England will provide bespoke advice on this as necessary. The list of species given here for this Annex I habitat feature at this SAC is not necessarily exhaustive. The list may evolve, and species may be added or deleted, as new information about this site becomes available.<br><br>Target set to Restore because a number of populations of these species have been reduced/lost due to encroachment of gorse, scrub and bracken and a reduction in structural diversity (resulting from a lack of grazing). | See sources of site based evidence for this attribute, associated with H4010 wet heath, listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Structure and function** | **Functional connectivity** | Restore the overall extent, quality and function of any supporting | This recognises the potential need at this site to maintain or restore the connectivity of the site to its wider landscape in | See sources of site based evidence for this attribute, |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| **(including its typical species)** | **with wider landscape** | features within the local landscape which provide a critical functional connection with the site | 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.<br><br>Approximately half of Mid Cornwall Moors SSSI is within Breney Common and Goss and Tregoss Moors SAC, with the remainder close to the SAC. The areas of SSSI outside of the SAC support a range of semi-natural vegetation types, including extensive areas of dry heath.<br><br>Target set to Restore because these patches of dry heath are fragmented, e.g. by roads and intensive agriculture. | associated with H4010 wet heath, listed above. |
| **Structure and function (including its typical species)** | **Adaptation and resilience** | Restore the feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site | This recognises the increasing likelihood of natural habitat features to absorb or adapt to wider environmental changes. Resilience may be described as the ability of an ecological system to cope with, and adapt to environmental stress and change whilst retaining the same basic structure and ways of functioning. Such environmental changes may include changes in sea levels, precipitation and temperature for example, which are likely to affect the extent, distribution, composition and functioning of a feature within a site. The vulnerability and response of features to such changes will vary. Using best available information, any necessary or likely adaptation or adjustment by the feature and its management in response to actual or expected climatic change should be allowed for, as far as practicable, in order to ensure the feature's long-term viability. | See sources of site based evidence for this attribute, associated with H4010 wet heath, listed above. |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| | | | 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. This means that this site is considered to be vulnerable overall but moderately so. This means that some adaptation action for specific issues may be required, 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.<br><br>Target set to Restore because the Breney Common and Goss and Tregoss Moors are fragmented, in particular by roads and intensive agriculture. | |
| **Structure and function (including its typical species)** | **Soils, substrate and nutrient cycling** | Maintain the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungal: bacterial ratio, to within typical values for the habitat. | Soil is the foundation of basic ecosystem function and a vital part of the natural environment. Its properties strongly influence the colonisation, growth and distribution of those plant species which together form vegetation types, and therefore provides a habitat used by a wide range of organisms. Soil biodiversity has a vital role to recycle organic matter. Changes to natural soil properties may therefore affect the ecological structure, function and processes associated with this Annex I feature. | See sources of site based evidence for this attribute, associated with H4010 wet heath, listed 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 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.<br><br>Maintain low nutrient levels to maintain high numbers of species through the management activities of grazing, burning, | See sources of site based evidence for this attribute, associated with H4010 wet heath, listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| | | | mowing, sod-cutting and scrub/tree cutting. Management of succession is a critical aspect of management for this habitat, by a combination of active processes and grazing/cutting.<br><br>A range of invertebrates and plants require bare ground/peat where it is not too frequently disturbed by vehicles or feet.<br><br>Target set to Restore because some areas of dry heath (both within and outside the SAC) require scrub control and/or changes to grazing to reduce scrub extent and restore structural diversity. | |
| **Supporting processes (on which the feature relies)** | **Air quality** | Restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk). | 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.<br><br>Critical Loads and Levels are recognised thresholds below which such harmful effects on sensitive UK habitats will not occur to a significant level, according to current levels of scientific understanding. There are critical levels for ammonia (NH3), oxides of nitrogen (NOx) and sulphur dioxide (SO2), and critical loads for nutrient nitrogen deposition and acid deposition. There are currently no critical loads or levels for other pollutants such as Halogens, Heavy Metals, POPs, VOCs or Dusts. These should be considered as appropriate on a case-by-case basis. Ground level ozone is regionally important as a toxic air pollutant but flux-based critical levels for the protection of semi-natural habitats are still under development. It is recognised that achieving this target may be subject to the development, availability and effectiveness of abatement technology and measures to tackle diffuse air pollution, within realistic timescales.<br><br>Target set to Restore because both nitrogen and acid deposition currently exceed their critical loads. | More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk ). |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| **Supporting processes (on which the feature relies)** | **Water quality** | Where the feature is dependent on surface water and/or groundwater, restore water quality and quantity to a standard which provides the necessary conditions to support the feature. | 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. 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.<br><br>Target set to Restore because both internal and external drains are reducing the water supply to the dry heath. It is also likely that evapotranspiration from invading scrub is further reducing the water supply.<br><br>The water supply mechanisms of the site are not fully understood and a hydrological study is required. | See sources of site based evidence for this attribute, associated with H4010 wet heath, listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Supporting processes (on which the feature relies)** | **Hydrology** | At a site, unit and/or catchment level (as necessary) restore 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. This target is generic and further site-specific investigations may be required to fully inform conservation measures and/or the likelihood of impacts.<br><br>Target set to Restore because both internal and external drains are disrupting the hydrology of the site. It is also likely that evapotranspiration from invading scrub is further reducing the water supply.<br><br>On a catchment scale, the headwaters of the River Fal are heavily modified, which is impacting the natural hydrological | See sources of site based evidence for this attribute, associated with H4010 wet heath, listed above. |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| | | | regime. Opportunities for re-naturalising this part of the catchment should be investigated. | |
| **Version Control**<br>Advice last updated: N/A | | | | |
| **Variations from national feature-framework of integrity-guidance**:<br>**Rationale for changes to site specific targets** - In some cases (particularly cover of *Ulex europaeus* and bracken, and for some of the positive and negative indicator species) targets for wet and dry heath have been amalgamated. This means some deviation from the CSM generic standards, but has the advantages of a more succinct table and facilitates the monitoring of wet and dry heath types combined which could be advantageous given that both types frequently occur in intimate mosaics within the same management or monitoring unit. The higher targets have been adopted here on the basis that the large scale of the site, habitat dynamism and the landscape-scale mosaic of habitat types lends itself to a higher tolerance of scrub, bracken, etc. | | | | |

**Table 3: Supplementary Advice for Qualifying Features: H7140. Transition mires and quaking bogs; 'Very wet mires often identified by an unstable 'quaking' surface'**

<table>
<tr><th colspan="2">Attributes</th><th>Targets</th><th>Supporting and Explanatory Notes</th><th>Sources of site-based evidence (where available)</th></tr>
<tr><td>Extent and distribution of the feature</td><td>Extent of the feature within the site</td><td>Restore the total extent of the feature to at least 31.5ha, whilst accepting no deterioration from current levels.<br><br>This target will be reviewed following the completion of the Growing Goss project.</td><td>There should be no measurable reduction (excluding any trivial loss) in the extent and area of this feature, and in some cases, the full extent of the feature may need to be restored. The baseline-value of extent given has been generated using data gathered from the listed site-based surveys. Area measurements given may be approximate depending on the methods, age and accuracy of data collection, and as a result this value may be updated in future to reflect more accurate information. The extent of an Annex I habitat feature covers the sum extent of all of the component vegetation communities present and may include transitions and mosaics with other closely-associated habitat features. Where a feature is susceptible to natural dynamic processes, there may be acceptable variations in its extent through natural fluctuations. Where a reduction in the extent of a feature is considered necessary to meet the Conservation Objective for another Annex I feature, Natural England will advise on this on a case-by-case basis.<br><br>There is currently approximately 31.5ha of H7140 transition mires on the site:<br><br><table><tr><th>NVC</th><th>Area (ha)</th></tr><tr><td>M2</td><td>0.02</td></tr><tr><td>M4</td><td>2.94</td></tr><tr><td>M5</td><td>0.40</td></tr><tr><td>M14*</td><td>5.64</td></tr><tr><td>M21</td><td>4.81</td></tr><tr><td>M29</td><td>0.21</td></tr><tr><td>S27</td><td>17.57</td></tr><tr><td>Total</td><td>31.59</td></tr></table></td><td>See sources of site based evidence for this attribute, associated with H4010 wet heath and H4030 dry heath, listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments</td></tr>
</table>

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| | | | *M14 can form part of H4010 wet heath of as well as H7140 transition mire. The mapped area of M14 has not been fully partitioned between these two SAC features so the total area of M14 on the site is given.<br><br>Target set to Restore because gorse, scrub and bracken have encroached on a number of areas of wet heath. The extent target will be reviewed once the long term objective for the mix of scrub and heath on site have been developed. | |
| **Extent and distribution of the feature** | **Spatial distribution of the feature within the site** | Restore the distribution and configuration of the feature, including where applicable its component vegetation types, across the site | Distribution includes the spatial pattern or arrangement of this habitat feature, and its component vegetation types, across the site. Changes in distribution may affect the nature and range of the vegetation communities present, the operation of the physical, chemical, and biological processes in the system and the resiliency of the site and its features to changes or impacts.<br><br>Target set to Restore because scrub has encroached on a number of areas of transition mire. | See sources of site based evidence for this attribute, associated with H4010 wet heath and H4030 dry heath, listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Structure and function (including its typical species)** | **Vegetation community composition** | Ensure the component vegetation communities of the feature are referable to and characterised by the following National Vegetation Classification types<br><br>M2 - *Sphagnum cuspidatum / fallax* agg. Bog pool community<br>M4 - *Carex rostrata - Sphagnum fallax* agg. mire<br>M5 - *Carex rostrata - Sphagnum squarrosum* mire<br><br>M14 - *Schoenus nigricans - Narthecium ossifragum* mire<br>M21 - *Narthecium ossifragum – Sphagnum papillosum* valley | 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. | See sources of site based evidence for this attribute, associated with H4010 wet heath and H4030 dry heath, listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| | | mire<br><br>M29 - *Hypericum elodes - Potamogeton polygonifolius* soakway<br><br>S27 - *Carex rostrata - Comarum palustre* tall-herb fen | | |
| **Structure and function (including its typical species)** | **Key structural, influential and/or distinctive species** | Restore the abundance of the species listed to enable each of them to be a viable component of the Annex I habitat feature.<br>The constant and preferential plants of the M2, M4, M5, M14, M21, M29 and S25 NVC community types which forms a key component of the SAC habitats that is present<br><br>Vascular plan assemblage including *Illecebrum verticillatum,* Coral Necklace; Baldellia ranunculoides, Lesser Water-plantain; *Centunculus minimus*, Chaffweed; *Chamaemelum nobile,* Chamomile; *Platanthera bifolia,* Lesser Butterfly-orchid; *Radiola linoides* Allseed; *Euphrasia vigursii*, Eyebright<br><br>Breney Common and Goss and Tregoss Moors support a suite of rare plants and invertebrates that form a distinctive component of the H7140 transition mire feature: *Hydrochus nitidicollis* Gravel water beetle | 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;<br><br>• **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').<br><br>• **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)<br><br>• **Site-distinctive** species which are considered to be a particularly special and distinguishing component of an Annex I habitat on a particular SAC.<br><br>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.<br><br>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. | See sources of site based evidence for this attribute, associated with H4010 wet heath and H4030 dry heath, listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| | | *Omphiscola glabra* Pond mud snail | Target set to Restore because a number of populations of these species have been reduced/lost due to encroachment of scrub and a reduction in structural diversity (resulting from a lack of grazing). | |
| **Structure and function (including its typical species)** | **Invasive, non-native and/or introduced species** | Ensure invasive and introduced non-native species are either rare or absent, but if present are causing minimal damage to the feature | Invasive or introduced non-native species 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. use of broad spectrum pesticides). | See sources of site based evidence for this attribute, associated with H4010 wet heath and H4030 dry heath, listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Structure and function (including its typical species)** | **Presence/ cover of woody species** | Restore a low cover (<10% of the area) of scrub or trees within stands of H7140. | Native trees and shrubs occur naturally on bog and fen surfaces but an abundance of scrub and trees on bogs and fens is sometimes regarded as detrimental because they are indicators and perpetrators of drying out and may cause damage to vegetation structure through shading effects. 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.<br><br>Target set to Restore because scrub has encroached areas of transition mire. | See sources of site based evidence for this attribute, associated with H4010 wet heath and H4030 dry heath, listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Structure and function (including its typical species)** | **Exposed substrate** | Maintain a low cover of exposed substrate.<br><br>**For areas of M4, M5, M21 NVC communities:** Total extent of exposed substrate should be no more than 10%<br><br>**For areas of M2, M14, M29 and S25:** Total extent of exposed substrate should be between 5% 25% | For this wetland habitat type, maintaining some continuous extent of exposed, open ground surface is required to support the establishment and supply of those component species which often rely on wet and sparsely-vegetated conditions.<br><br>A high frequency and cover of exposed substrate (usually peat) will usually be undesirable and may indicate over-grazing and water scour. Patches of exposed substrate are likely to be more typical/desirable for M14, S3, S10, S27 and some examples of M1-3 and M6. M29 is often based on unconsolidated sloppy peat exposed beneath a water film. | See sources of site based evidence for this attribute, associated with H4010 wet heath and H4030 dry heath, listed above<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| **Structure and function (including its typical species)** | **Hydrology** | At a site, unit and/or catchment level (as necessary) restore 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. This target is generic and further site-specific investigations may be required to fully inform conservation measures and/or the likelihood of impacts.<br><br>Wheeler et al. (2009) provide range and mean for summer & winter water levels for those wetland NVC types constituting Annex 1 habitats. This provides a rough guide to appropriate levels, but it is critical that individual sites and their needs are considered as there is considerable variation within the NVC communities listed and recorded water levels.<br><br>Target set to Restore because both internal and external drains are disrupting the hydrology of the site. It is also likely that evapotranspiration from invading scrub is further reducing the water supply.<br><br>On a catchment scale, the headwaters of the River Fal are heavily modified, which is impacting the natural hydrological regime. Opportunities for re-naturalising this part of the catchment should be investigated. | See sources of site based evidence for this attribute, associated with H4010 wet heath and H4030 dry heath, listed above<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Structure and function (including its typical species)** | **Water chemistry** | Maintain the surface water and groundwater supporting the hydrology of the bog at a low nutrient status. | UKTAG (2012) provides threshold values for nitrate concentration in groundwaters for different wetland types. The threshold values will mainly be used in the characterisation of GWDTE status for the WFD, primarily as a risk screening tool, to assess if sites are 'at risk' or 'not at risk' from groundwater mediated nutrient pressure. Due to the complex cycling of nutrients within many GWDTE, these threshold values are less well suited for application within sites but rather just to groundwater that is directly feeding the site. | |
| **Structure and function (including its** | **Hydrology** | Maintain a high piezometric head and permanently high water table (allowing for natural seasonal | 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 | |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| **typical species)** | | fluctuations) on groundwater dependent sites. | source, depth, duration, frequency, magnitude and timing of water supply can have significant implications for the assemblage of characteristic plants and animals present.<br><br>This target is generic and further site-specific investigations may be required to fully inform conservation measures and/or the likelihood of impacts. Some examples of H7140 may be wholly or partly groundwater dependent. Others have a greater dependence on surface water or rain water inputs. It is critically important to understand the eco hydrological context of all sites.<br><br>The water supply mechanisms of the site are not fully understood and a hydrological study is required. | |
| **Structure and function (including its typical species)** | **Adaptation and resilience** | Restore the feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site | This recognises the increasing likelihood of natural habitat features to absorb or adapt to wider environmental changes. Resilience may be described as the ability of an ecological system to cope with, and adapt to environmental stress and change whilst retaining the same basic structure and ways of functioning. Such environmental changes may include changes in sea levels, precipitation and temperature for example, which are likely to affect the extent, distribution, composition and functioning of a feature within a site.<br><br>The vulnerability and response of features to such changes will vary. Using best available information, any necessary or likely adaptation or adjustment by the feature and its management in response to actual or expected climatic change should be allowed for, as far as practicable, in order to ensure the feature's long-term viability.<br><br>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. This means that this site is considered to be vulnerable overall but moderately so. This means that some adaptation action for specific issues may be required, such as reducing habitat fragmentation, creating more habitat to buffer the site or expand the habitat into more varied | See sources of site based evidence for this attribute, associated with H4010 wet heath and H4030 dry heath, listed above. |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| | | | 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.<br><br>Target set to Restore because the Breney Common and Goss and Tregoss Moors are fragmented, in particular by roads and intensive agriculture. | |
| **Structure and function (including its typical species)** | **Supporting off-site habitat** | Restore the extent, quality and spatial configuration of land or habitat surrounding or adjacent to the site which is known to support the feature. | Include only where applicable. The structure and function of the qualifying habitat, including its typical species, may rely upon the continued presence of areas which surround and are outside of the designated site boundary. Changes in surrounding land-use may adversely (directly/indirectly) affect the functioning of the feature and its component species. This supporting habitat may be critical to the typical species of the feature to support their feeding, breeding, roosting, population dynamics ('metapopulations'), pollination or to prevent/reduce/absorb damaging impacts from adjacent land uses e.g. pesticide drift, nutrient enrichment.<br><br>Approximately half of Mid Cornwall Moors SSSI is within Breney Common and Goss and Tregoss Moors SAC, with the remainder close to the SAC. The areas of SSSI outside of the SAC support a range of semi-natural vegetation types, including transition mire.<br><br>Target set to Restore because these patches of semi-natural vegetation are fragmented, e.g. by roads and intensive agriculture. | See sources of site based evidence for this attribute, associated with H4010 wet heath and H4030 dry heath, listed above. |
| **Supporting processes (on which the feature relies)** | **Air quality** | Restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk). | This habitat type is considered sensitive to changes in air quality. Exceedance of these critical values for air pollutants may modify the chemical status of its substrate, accelerating or damaging plant growth, altering its vegetation structure and composition and causing the loss of sensitive typical species associated with it. Critical Loads and Levels are recognised thresholds below which such harmful effects on sensitive UK habitats will not occur to a significant level, according to current levels of scientific understanding. There are critical levels for ammonia (NH3), oxides of nitrogen (NOx) and sulphur dioxide | More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk ). |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| | | | (SO2), and critical loads for nutrient nitrogen deposition and acid deposition. There are currently no critical loads or levels for other pollutants such as Halogens, Heavy Metals, POPs, VOCs or Dusts. These should be considered as appropriate on a case-by-case basis. Ground level ozone is regionally important as a toxic air pollutant but flux-based critical levels for the protection of semi-natural habitats are still under development. It is recognised that achieving this target may be subject to the development, availability and effectiveness of abatement technology and measures to tackle diffuse air pollution, within realistic timescales.<br><br>Target set to Restore because both nitrogen and acid deposition currently exceed their critical loads. | |
| **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 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. This habitat in most cases requires ongoing cutting or grazing maintain its open character.<br><br>Target set to Restore because some areas of transition mire (both within and outside the SAC) require scrub control to reduce scrub extent and restore structural diversity. | See sources of site based evidence for this attribute, associated with H4010 wet heath and H4030 dry heath, listed above.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Version Control**<br>Advice last updated: N/A | | | | |
| **Variations from national feature-framework of integrity-guidance**:<br>Rationale for changes to site specific targets - "7140 Transition mires and quaking bogs SAC feature is considered to equate to the following communities: M2, M4, M5, M14, M21, M29 & S27 (following advice from Iain Diack, Senior Specialist, wetlands (Natural England Specialist Services Team), email: 09/01/2018)." The inclusion of some types of M21 (which is explicitly excluded by the JNCC Annex 1 definition), particularly those that have developed hydroserally from fen, and those that include transitions to soakaway communities such as M14 fits well with the sites found within the SAC. | | | | |

## Table 4: Supplementary Advice for Qualifying Features: S1065. *Euphydryas* (*Eurodryas*, *Hypodryas*) *aurinia*; Marsh fritillary butterfly

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| **Population (of the feature)** | **Population abundance** | Restore the abundance of the population, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent. | This will ensure there is a viable population of the feature which is being maintained at or increased to a level that contributes as appropriate to its Favourable Conservation Status across its natural range in the UK. Due to the dynamic nature of population change, the target-value given for the population size or presence of this feature is considered to be the minimum standard for conservation/restoration measures to achieve.<br><br>This minimum-value may be revised where there is evidence to show that a population's size or presence has significantly changed as a result of natural factors or management measures and has been stable at or above a new level over a considerable period (generally at least 10 years). The values given here may also be updated in future to reflect any strategic objectives which may be set at a national level for this feature.<br><br>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.<br><br>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 ENGLAND. 2014. *Breney Common and Goss and Tregoss Moors Site Improvement Plan v1.0* Natural England. Available at: http://publications.naturalengland.org.uk/publication/4613474239905792<br><br>NATURAL ENGLAND. 2017. *Mid Cornwall Moors SSSI Supporting Information. A supplement to the notification document.* Natural England. Available from Natural England on request.<br><br>Various marsh fritillary monitoring reports listed in Mid Cornwall Moors Supporting Information document. Available from Natural England on request.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| | | | 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. For this feature counting the conspicuous larval webs is a good measure of population density; as well as the more standardised transect counts of adults<br><br>Flight and larval web surveys of the marsh fritillary have been carried out annually between 2003 and 2007 as part of the Goss Moor LIFE Project on nine of the Mid Cornwall Moor sites as well as during 2008 and 2009 at Red Moor and Breney Common and on all sites during 2010 and 2011, which included an additional five sites (three of which are within the boundary of the Mid Cornwall Moors SSSI). Red Moor and Breney Common continue to be monitored annually by the Cornwall Wildlife Trust (CWT). These surveys show that colonies have historically persisted at Goss Moor, Breney Common and Red Moor where it reappeared after a long absence in 2006.<br><br>Breney Common remains the most stable site for this species with the highest population index of all sites (see Table below). Criggan Moor and Mollinis also emerge as two of the more stable sites during the period of the monitoring programme, though even here there were declines in 2011. It is unlikely that marsh fritillary has completely disappeared from all areas of Goss Moor, and it is likely that there are unknown populations in pockets of habitat that are less accessible. However, the species is clearly present at a much lower density than it was in the past. Such severe declines, local extinctions and colonisations are of course a natural part of the population cycle of this species.<br><br>The transect counts of larval webs undertaken at Breney Common and Goss Moor in recent years provides a baseline for monitoring change in population size: | |

<table>
<tr><th colspan="2">Attributes</th><th>Targets</th><th>Supporting and Explanatory Notes</th><th>Sources of site-based evidence (where available)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td></td><td colspan="2">Marsh fritillary population index</td></tr>
<tr><td>Year</td><td>Breney Common</td><td>Goss Moor</td></tr>
<tr><td>2004</td><td>114.25</td><td>1374.92</td></tr>
<tr><td>2005</td><td>66.52</td><td>511.45</td></tr>
<tr><td>2006</td><td>34.66</td><td>454.04</td></tr>
<tr><td>2007</td><td>44.64</td><td>177.18</td></tr>
<tr><td>2010</td><td>237.82</td><td>153</td></tr>
<tr><td>2011</td><td>124.21</td><td>0</td></tr>
</table>
<br>Target set to Restore because a number of patches of wetland habitat (both within and outside of the SAC) require scrub control and/or changes to grazing regimes to provide optimum marsh fritillary habitat.</td><td></td></tr>
<tr><td>Supporting habitat: extent and distribution</td><td>Distribution of supporting habitat</td><td>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</td><td>A contraction in the range, or geographic spread, of the feature (and its component vegetation) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. Contraction may also reduce and break up the continuity of a habitat within a site and how well the species feature is able to occupy and use habitat within the site. Such fragmentation may have a greater amount of open edge habitat which will differ in the amount of light, temperature, wind, and even noise that it receives compared to its interior. These conditions may not be suitable for this feature and this may affect its viability.<br><br>See comments on supporting habitat in ‘Extent of supporting habitat’ attribute, above. Annex 1 shows the distribution of potential breeding habitat across the Mid Cornwall Moors and illustrates both the potential and importance of the site for a functioning meta-population across this landscape.<br><br>Target set to Restore because areas of gorse and scrub have fragmented patches of supporting habitat within the site and grazing intensity in some areas needs to be adjusted to</td><td>NATURAL ENGLAND 2005 – 2015. National Vegetation Classification GIS data. Available from Natural England on request.<br><br>NATURAL ENGLAND. 2014. Breney Common and Goss and Tregoss Moors Site Improvement Plan v1.0 Natural England. Available at: http://publications.naturalengland.org.uk/publication/4613474239905792<br><br>NATURAL ENGLAND. 2017. Mid Cornwall Moors SSSI Supporting Information. A supplement to the notification document. Natural England. Available from Natural England on request.<br><br>This attribute will be periodically</td></tr>
</table>

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| | | | achieve the sward height target. | monitored as part of Natural England's SSSI Condition Assessments |
| **Supporting habitat: extent and distribution** | **Extent of supporting habitat** | Restore the total extent of the habitats which support the feature to 816.01 hectares | In order to contribute towards the objective of achieving an overall favourable conservation status of the feature at a UK level, it is important to maintain or if appropriate restore the extent of supporting habitats and their range within this SAC. The 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.<br><br>The site supports a complex mosaic of semi-natural habitats, the vast majority of which provide supporting habitat for marsh fritillary: eggs are laid on devil's-bit scabious (predominantly in wet heath and rush pasture), while adults nectar on a variety of flowers throughout the site and scrub provides important shelter.<br><br>The area of potential breeding habitat on the site is estimated to be 211.2 ha (Natural England 2017b). See Annex 1 for the distribution of this habitat across the site. This area estimate does not include stands of scrub that provide shelter or important nectar sources outside of breeding areas, so the total extent of supporting habitat on site will be larger than this. The long term objective for the mix of scrub and other habitats on site has not been fully developed and so an area target has not been set.<br><br>Target set to Restore because some core wetland breeding areas have become unsuitable through bracken, gorse and scrub encroachment and loss of structural diversity from insufficient/inappropriate grazing. | NATURAL ENGLAND 2005 – 2015. *National Vegetation Classification GIS data.* Available from Natural England on request<br><br>NATURAL ENGLAND. 2014. *Breney Common and Goss and Tregoss Moors Site Improvement Plan v1.0* Natural England. Available at: http://publications.naturalengland.org.uk/publication/4613474239905792<br><br>NATURAL ENGLAND. 2017. *Mid Cornwall Moors SSSI Supporting Information. A supplement to the notification document.* Natural England. Available from Natural England on request.<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Supporting habitat: structure/** | **Ground moisture** | Maintain a sufficiently long sward during the summer months to avoid dessication of the *Succisa* | Sward height should be long enough during spring/ summer months that the larval food plant does not become dessicated but not so tall that foodplants become out-competed by *Molinia* | |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| **function** | | plants on which the larvae feed. | (see 'Vegetation structure – sward height' attribute). | |
| **Supporting habitat: structure/ function** | **Soils, substrate and nutrient cycling** | Maintain the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungal: bacterial ratio, within typical values for the supporting habitat | Soil supports basic ecosystem function and is a vital part of the natural environment. Its properties strongly influence the colonisation, growth and distribution of those plant species which together form vegetation types, and therefore provides a habitat used by a wide range of organisms. Soil biodiversity has a vital role to recycle organic matter. Changes to natural soil properties may therefore affect the ecological structure, function and processes associated with the supporting habitat of this Annex II feature. | National Soil Map of England and Wales – NATMAP<br>See:<br>http://www.landis.org.uk/data/natmap.cfm) |
| **Supporting habitat: structure/ function** | **Vegetation composition - presence of foodplants** | Restore an abundance of devils-bit scabious *Succisa pratensis* within supporting habitat | As the feature's larval foodplant, *Succisa* should be common enough in the sward that there will always be a good and continuous number of suitable plants for egg-laying; this is particularly important on calcareous grassland sites, which are more prone to drought.<br><br>Target set to Restore because insufficient grazing in some areas has resulted in a coarse sward which has reduced the density of *Succisa* plants. | NATURAL ENGLAND. 2014. *Breney Common and Goss and Tregoss Moors Site Improvement Plan v1.0* Natural England. Available at: http://publications.naturalengland.org.uk/publication/4613474239905792<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Supporting habitat: structure/ function** | **Vegetation structure - sward height (neutral grassland)** | Restore appropriate sward conditions (typically this should be between 8-25cms) with an uneven patchwork of short and long vegetation by the end of the grazing period. | By the end of the summer grazing season (September) the sward should be diverse and well structured, with a range of heights between 8 cm and 25 cm, with *Succisa* growing among *Molinia* tussocks. These conditions provide suitable sheltered niches for overwintering larvae.<br><br>Target includes Restore because grazing intensity in some areas needs to be adjusted to achieve the sward height target. | NATURAL ENGLAND. 2014. *Breney Common and Goss and Tregoss Moors Site Improvement Plan v1.0* Natural England. Available at: http://publications.naturalengland.org.uk/publication/4613474239905792<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| **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 | This recognises the increasing likelihood of supporting habitat features to absorb or adapt to wider environmental changes. Resilience may be described as the ability of an ecological system to cope with, and adapt to environmental stress and change whilst retaining the same basic structure and ways of functioning. Such environmental changes may include changes in sea levels, precipitation and temperature for example, which are likely to affect the extent, distribution, composition and functioning of a feature within a site.<br><br>The vulnerability and response of features to such changes will vary. Using best available information, any necessary or likely adaptation or adjustment by the feature and its management in response to actual or expected climatic change should be allowed for, as far as practicable, in order to ensure the feature's long-term viability.<br><br>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 supporting habitats. This means that this site is considered to be vulnerable overall but moderately so.<br><br>This means that some adaptation action for specific issues may be required, 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. Target set to Restore because marsh fritillary supporting habitat is fragmented. In particular, the two main components of the site (Breney Common and Goss and Tregoss Moors) are separated by roads and intensive agriculture. | NATURAL ENGLAND. 2014. *Breney Common and Goss and Tregoss Moors Site Improvement Plan v1.0* Natural England. Available at: http://publications.naturalengland.org.uk/publication/4613474239905792<br><br>NATURAL ENGLAND, 2015. *Climate Change Theme Plan and supporting National Biodiversity Climate Change Vulnerability assessments ('NBCCVAs') for SACs and SPAs in England.* Natural England. Available at: http://publications.naturalengland.org.uk/publication/4954594591375360 |
| **Supporting processes (on which the** | **Air quality** | Maintain or, where necessary, restore concentrations and deposition of air pollutants to at | The supporting habitat of this feature is considered sensitive to changes in air quality. Exceedance of these critical values for air pollutants may modify the chemical status of its substrate, | More information about site-relevant Critical Loads and Levels for this SAC is available by using |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| **feature and/or its supporting habitat relies)** | | 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). | accelerating or damaging plant growth, altering its vegetation structure and composition (including food-plants) and reducing supporting habitat quality and population viability of this feature.<br><br>Critical Loads and Levels are recognised thresholds below which such harmful effects on sensitive UK habitats will not occur to a significant level, according to current levels of scientific understanding. There are critical levels for ammonia (NH3), oxides of nitrogen (NOx) and sulphur dioxide (SO2), and critical loads for nutrient nitrogen deposition and acid deposition. There are currently no critical loads or levels for other pollutants such as Halogens, Heavy Metals, POPs, VOCs or Dusts. These should be considered as appropriate on a case-by-case basis.<br><br>Ground level ozone is regionally important as a toxic air pollutant but flux-based critical levels for the protection of semi-natural habitats are still under development. It is recognised that achieving this target may be subject to the development, availability and effectiveness of abatement technology and measures to tackle diffuse air pollution, within realistic timescales.<br><br>Target set to Restore because both nitrogen and acid deposition currently exceed their critical loads for a range of supporting habitats. | the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk ). |
| **Supporting processes (on which the feature and/or its supporting habitat relies)** | **Conservation measures** | 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 S1065 marsh fritillary 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.<br><br>Low intensity grazing is required to maintain suitable vegetation structure and food plant density for the marsh fritillary. If | NATURAL ENGLAND. 2014. *Breney Common and Goss and Tregoss Moors Site Improvement Plan v1.0* Natural England. Available at: http://publications.naturalengland.org.uk/publication/4613474239905792<br><br>NATURAL ENGLAND. 2017. *A statement of Natural England's views about the management of* |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| | | | grazing is too intensive then the sward becomes uniform and the abundance of devil's-bit scabious is reduced. Conversely, if grazing is insufficient then vegetation becomes too coarse. Optimum grazing regimes alone are not sufficient to control scrub and maintain open areas and so additional scrub control is also required.<br><br>Target set to Restore because large areas of the site have not been grazed for a number of years which has resulted in the development of rank swards and extensive gorse, scrub and bracken growth. The vegetation structure in these areas is not suitable for marsh fritillary. In addition, thick is scrub is fragmenting marsh fritillary habitat and also drying parts of the site out, further reducing habitat quality. | *Mid Cornwall Moors Site of Special Scientific Interest (SSSI)*. Natural England. Available at: https://designatedsites.naturalengland.org.uk/PDFsForWeb/VAM/2000707.pdf<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Supporting processes (on which the feature and/or its supporting habitat relies)** | **Grazing pressure** | Restore a cattle or pony-dominated grazing regime. Stock may be removed May-September, but light continuous cattle grazing is more beneficial than short-term heavy grazing, as long as the correct sward structure is maintained and sites do not become overgrazed. | Cattle grazing is preferable as it produces a less uniform sward; also sheep tend to selectively graze the Succisa, which is likely to be detrimental to marsh fritillary populations. If sheep are used it should be at a very low stocking ration (especially on calcareous sites, where care should be taken that sites aren't overgrazed, resulting in a short sward and increased risk of dessication of Succisa plants (if they aren't actually eaten). Sheep should not graze during the summer months - cattle/ pony grazing during summer may be OK if at a low stocking density.<br><br>Target set to Restore because cattle grazing needs to be re-introduced to some areas. | NATURAL ENGLAND. 2014. *Breney Common and Goss and Tregoss Moors Site Improvement Plan v1.0* Natural England. Available at: http://publications.naturalengland.org.uk/publication/4613474239905792<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Supporting processes (on which the feature and/or its supporting habitat relies)** | **Water quantity/ quality** | Where the feature or its supporting habitat is dependent on surface water and/or groundwater, restore water quality and quantity to a standard which provides the necessary conditions to support the feature. | 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.<br><br>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 | NATURAL ENGLAND. 2014. *Breney Common and Goss and Tregoss Moors Site Improvement Plan v1.0* Natural England. Available at: http://publications.naturalengland.org.uk/publication/4613474239905792<br><br>NATURAL ENGLAND. 2017. *A* |

| Attributes | | Targets | Supporting and Explanatory Notes | Sources of site-based evidence (where available) |
|---|---|---|---|---|
| | | | the achievement of SAC Conservation Objectives but in some cases more stringent standards may be needed to reflect the ecological needs of the species feature. Further site-specific investigations may be required to establish appropriate water quality standards for the SAC.<br><br>Target set to Restore because both internal and external drains are reducing the water supply to the wetland vegetation communities. It is also likely that evapotranspiration from invading scrub is further reducing the water supply.<br><br>The water supply mechanisms of the site are not fully understood and a hydrological study is required. | *statement of Natural England's views about the management of Mid Cornwall Moors Site of Special Scientific Interest (SSSI)*. Natural England. Available at: https://designatedsites.naturalengland.org.uk/PDFsForWeb/VAM/2000707.pdf<br><br>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments |
| **Version Control**<br>Advice last updated: **20 March 2019**: Following stakeholder feedback. Additional text about grazing levels and sward structure added to various attributes. | | | | |
| **Variations from national feature-framework of integrity-guidance:** N/A | | | | |

## Annex 1: Distribution of marsh fritillary and key supporting habitats within Mid Cornwall Moors SSSI