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

Pewsey Downs Special Area of Conservation (SAC)
Site Code: UK0012552

Photo: Ben Cooke Natural England

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About this document

This document provides Natural England's supplementary advice about the European Site Conservation Objectives relating to Pewsey Downs SAC.

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

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	Pewsey Downs Special Area of Conservation (SAC)
Location	Wiltshire
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	153.87 ha
Designation Changes	None
Feature Condition Status	Details of the feature condition assessments made at this site can be found using Natural England's Designated Sites System
Names of component Sites of Special Scientific Interest (SSSIs)	Pewsey Downs SSSI
Relationship with other European or International Site designations	Not Applicable

Site background and geography

Pewsey Downs SAC lies on the southern edge of the Marlborough Downs close to the village of Alton Barnes. It is located within the North Wessex Downs AONB and Berkshire and Marlborough Downs National Character Area (NCA Profile 116)

The site lies on the Cretaceous chalk which forms the high ground of the Marlborough Downs and is part of the south facing chalk escarpment on the northern edge of the Vale of Pewsey. The steep chalk escarpment is indented by a number of impressive coombes and dry valleys which provide a varied topography. The topography provides a variety of micro climates and aspects which is reflected in the diversity of wildflowers and other species found on the site. Milk Hill is the highest point in Wiltshire at 294 metres above sea level.

Soils vary across the site from deep rich neutral soils in the Coombes and base of the escarpment and clay with flints on the hill tops giving rise to a mosaic of acid and neutral grassland. The chalk redzina soils on the escarpment support extensive areas of species rich chalk grassland.

Pewsey Downs has a wealth of significant archaeological and historic features dating back to Neolithic Bronze Age, Iron Age and Saxon times including several designated as Scheduled Monuments such as the Wansdyke, Adams Grave Neolithic long barrow on Walkers Hill and the impressive causewayed camp on Knapp Hill. Pewsey Downs is also designated as an SSSI and National Nature Reserve (NNR). Consisting of three hills on the southern edge of the Marlborough Downs the reserve is famous for the Alton Barnes or Pewsey White Horse, one of several iconic chalk horse carvings characteristic of the wider landscape. The NNR is used extensively for recreation. Views from the reserve stretch across the

Vale of Pewsey all the way to Salisbury Plain. There are a number of well used bridle paths and other Rights of Way.

The scarp slope supports extremely rich chalk grassland flora, considered to be one of the best examples in the UK. Much of the turf is dominated by a sheep's-fescue – meadow oat-grass (*Festuca ovina – Helictotrichon pratense*) CG2 National Vegetation Classification (NVC) community, although in some areas upright brome *Bromopsis erecta* CG3 grassland is the dominant type. There are also fragments of acid grassland communities with rare dwarf mouse ear *Cerastium pumilum*. Grazing with cattle and sheep is important to maintain the diversity of species.

The site also supports a rich butterfly community including scarce species such as marsh fritillary *Euphydryas aurina* chalk hill *Polyommatus coridon* and Adonis blue *Polyommatus bellargus*. The SAC is part of the larger Pewsey Downs SSSI also designated for its chalk grassland communities and butterflies. The SAC is at the centre of a landscape scale farmer group project which aims to link areas of chalk grassland and increase connectivity for the marsh fritillary butterfly and other species.

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:

- **H6210/ H6211. Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia) (important orchid sites); Dry grasslands and scrublands on chalk or limestone (important orchid sites) ***

These grasslands are typically found on thin, well-drained, lime-rich soils associated with chalk and limestone. They occur predominantly at low to moderate altitudes in England and Wales, extending locally into upland areas in northern England, Scotland and Northern Ireland. Most of these calcareous grasslands are maintained by grazing.

A large number of rare plants are associated with this habitat, including, on Pewsey Downs SAC: Burnt tip orchid *Neotina ustulata*, bastard-toadflax *Thesium humifusum,* field fleawort *Tephroseris integrifolia*, dwarf mouse ear *Cerastium pumilum,* and the early gentian *Gentianella anglica*. The invertebrate fauna is also noteworthy, and includes rarities such as the marsh fritillary butterfly, adonis blue butterfly and chalk hill blue.

It supports extensive examples of CG2 *Festuca ovina-Avenula pratensis* grassland with areas of CG3 *Bromus erectus* grassland. Many herbs characteristic of Wiltshire downland are widespread such as devil's-bit scabious *Succisa pratensis*, saw-wort *Serratula tinctoria*, ox-eye daisy *Leucanthemum vulgare* and chalk milkwort *Polygala calcarea.*

This SAC is also distinctive in hosting the priority habitat type "orchid rich sites". This priority habitat type comprises calcareous grasslands which contain either a rich suite of orchid species, important populations of at least one nationally uncommon orchid species or one or several orchid species considered to be rare, very rare or exceptional in the UK. In addition to burnt tip orchid, the uncommon green-winged orchid *Anacamptis morio*, autumn lady's-tresses *Spiranthes spiralis* and frog orchid *Coeloglossum viride* are also present, together with a rich assemblage of more widespread species, including bee orchid *Ophrys apifera*, fragrant orchid *Gymnadenia conopsea* and pyramidal orchid *Anacamptis pyramidalis*.

Qualifying Species:

- **S1654. *Gentianella anglica*; Early gentian**

Early gentian is an annual plant occurring in calcareous grassland, mainly on steep, south-facing slopes. It grows on bare ground or in thin turf that is kept open by a combination of rabbit or sheep grazing and trampling by livestock on thin droughty soils. In dense turf it becomes shaded out and unable to compete with other more vigorous species. This species can undergo significant population fluctuations, both regionally due to weather conditions and on individual sites as a reflection of grazing levels.

Early gentian occurs mainly on chalk escarpments in central southern England, but its range extends to Cornwall and south west Wales and northwards to Lincolnshire. Pewsey Down is one of three sites selected in the central part of the range. It holds very significant populations of plants in high quality chalk grassland.

Table 1: Supplementary Advice for Qualifying Features: H6210. Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia) (important orchid sites); Dry grasslands and scrublands on chalk or limestone (important orchid sites) *

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Extent and distribution of the feature	**Extent of the feature within the site**	Maintain the total extent of the feature at 107.7 ha (75.7 hectares CG2 and 31.9 ha CG3.)	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.	Wiltshire Chalk Grassland NVC Survey 1989. (Archived internal Natural England survey data available on request.) NATURAL ENGLAND 2009 / 2012 Definitions of Favourable Condition: Pewsey Downs SSSI (Available on request from Natural England) This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Extent and distribution of the feature	**Spatial distribution of the feature within the site**	Maintain 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,	Wiltshire Chalk Grassland NVC Survey 1989 (Archived internal Natural England survey data available on request.) NATURAL ENGLAND 2009/ 2012 Definitions of Favourable Condition: Pewsey Downs SSSI (Available on request from Natural England) PAYNE K, 1987 *NVC Survey and Pewsey Downs Management Plan.* Nature Conservancy (Archived internal Natural

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			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.	England document available on request.) 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 • CG2 *Festuca ovina - Avenula pratensis* grassland • CG3 *Bromus erectus* grassland	This habitat feature will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management. In the UK these have been categorised by the National Vegetation Classification (NVC). Maintaining or restoring these characteristic and distinctive vegetation types, and the range of types as appropriate, will be important to sustaining the overall habitat feature. This will also help to conserve their typical plant species (i.e. the constant and preferential species of a community), and therefore that of the SAC feature, at appropriate levels (recognising natural fluctuations). Detailed NVC surveys (dated 1985 and 1991) show a complex mosaic of vegetation communities due to varied soils, topography, aspect, and past management history. Areas of CG2 and CG3a may oscillate between the two communities without loss of conservation interest depending on grazing pressure and season, as communities are distinguished by quantity of *Bromus erectus* present and this is highly susceptible to grazing.	Wiltshire Chalk Grassland NVC Survey 1989. (Archived internal Natural England survey data available on request.) PAYNE K 1985 NVC Survey and 1987 Pewsey Downs Management Plan Nature Conservancy. (Archived internal Natural England document available on request.) McSWEENEY P, 1991 Chalk grassland survey, English Nature (Archived internal Natural England survey data available on request.) This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	**Vegetation: proportion of herbs (including *Carex* spp)**	Maintain the proportion of herbaceous species within the range 40%-90%	A high cover of characteristic herbs, including sedges (Carex species) is typical of the structure of this habitat type.	NATURAL ENGLAND 2009/ 2012 Definitions of Favourable Condition: Pewsey Downs SSSI (Available on request from Natural England)

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
				HEWINS, E. 2015, Habitat Surveillance data project Pewsey Downs results for Unit 5 Knapp Hill results (Survey on behalf of Natural England available on request from Natural England) This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	**Key structural, influential and/or distinctive species**	Maintain the abundance of the typical species listed below to enable each of them to be a viable component of the Annex 1 habitat; Constant and preferential plant species of the CG2 *Festuca ovina - Avenula pratensis* grassland and CG3 *Bromus erectus* grassland NVC vegetation types at this SAC **Important orchid spp**: burnt orchid *Orchis ustulata*, green-winged orchid *Orchis morio*, autumn lady's-tresses *Spiranthes spiralis,* frog orchid *Coeloglossum viride,* bee orchid *Ophrys apifera*, lesser butterfly orchid *Platanthera bifolia*, fragrant orchid *Gymnadenia conopsea* and pyramidal orchid *Anacamptis pyramidalis*.	Some plant or animal species (or related groups of such species) make a particularly important contribution to the necessary structure, function and/or quality of an Annex I habitat feature at a particular site. These species will include; • **Structural** species which form a key part of the Annex I habitat's structure or help to define that habitat on a particular SAC (see also the attribute for 'vegetation community composition'). • **Influential** species which are likely to have a key role affecting the structure and function of the habitat (such as bioturbators (mixers of soil/sediment), grazers, surface borers, predators or other species with a significant functional role linked to the habitat) • **Site-distinctive** species which are considered to be a particularly special and distinguishing component of an Annex I habitat on a particular SAC. There may be natural fluctuations in the frequency and cover of each of these species. The relative contribution made by them to the overall ecological integrity of a site may vary, and Natural England will provide bespoke advice on this as necessary. The list of species given here for this Annex I habitat feature at this SAC is not necessarily exhaustive. The list may evolve, and species may be added or deleted, as new information	NATURAL ENGLAND 2009/ 2012 Definitions of Favourable Condition: Pewsey Downs SSSI (Available on request from Natural England) HEWINS, E. 2015, Habitat Surveillance data project Pewsey Downs results Unit 5 Knapp Hill (Survey on behalf of Natural England available on request from Natural England) WILSON, P and PRICE, D (Species Recovery Trust), 2017. Early gentian *Gentianella anglica:* Sample Survey of Sites in England (Survey on behalf of Natural England. Report available on request from Natural England) This attribute will be periodically monitored as part of Natural England's SSSI condition assessments

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		Important invertebrate assemblage including: Adonis blue *Polyommatus belargus,* marsh fritillary *Euphydryas aurinia,* chalkhill blue *Polyommatus coridon,* small blue *Cupidio minimus* dingy skipper *Erynnis tages,* brown argus *Aricia agestis,* dark green fritillary dark green fritillary Argynnis aglaja, Duke of Burgundy *Hamearis lucina* yellow meadow ant *Lasius flavus*	about this site becomes available.	Detailed locations and grid references found in Pewsey Downs SSSI Wiltshire Botanical Society Survey (2007/08). Distribution maps also available. This report also includes historical records from the NNR (Keith Payne maps dated 1984 and 1986). (NNR data is held by NATURAL ENGLAND, 2007/8 Data held by NE, BSBI and Wiltshire Botanical Society. Wiltshire Biological Records Centre also hold data. More recent post 2007/8 occasional records by Wilts Botanical Society and Natural England are held by Natural England and available on request. Butterfly transect records also held by Natural England and local Butterfly Conservation group. (Available on request from Natural England)
Structure and function (including its typical species)	**Vegetation: undesirable species**	Maintain the frequency/cover of the following undesirable species to within acceptable levels and prevent changes in surface condition, soils, nutrient levels or hydrology which may encourage their spread;	There will be a range of undesirable or uncharacteristic species which, if allowed to colonise and spread, are likely to have an adverse effect on the feature's structure and function, including its more desirable typical species. These may include invasive non-natives such as Cotoneaster spp, or coarse and aggressive native species which may uncharacteristically dominate the composition of the feature. **Undesirable species include:** Creeping thistle *Cirsium arvense,* spear thistle *Cirsium vulgare,* curled dock *Rumex crispus,* broad leaved dock *Rumex obtusifolius,* common ragwort *Senecio jacobaea,* common nettle *Urtica dioica;* tor grass *Brachypodium pinnatum,* upright brome *Bromopsis*	NATURAL ENGLAND 2009/ 2012 Definitions of Favourable Condition: Pewsey Downs SSSI (Available on request from Natural England) This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
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Structure and function (including its typical species)	**Vegetation community transitions**	Maintain the pattern of natural vegetation zonations/transitions	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. As well as calcicolous grassland the site includes species-rich neutral grassland (MG5) and areas which exhibit a transition between CG2, CG3 and MG5. In addition, species-poor grassland is found on deeper soils at the top and bottom of slopes. Vegetation transitions are associated with differences in soil depth, slope, aspect and microclimatic conditions. Detailed NVC surveys (dated 1985 and 1990) show a complex mosaic of vegetation communities due to varied soils, topography, aspect, and past management history. There is also a complicated relationship with non-notified grassland communities e.g. MG5, MG6, MG7. The site includes areas of MG5b *Cynosurus cristatus – Centaurea nigra* grassland (found over deeper soils and on north facing slopes)	NATURAL ENGLAND 2009/ 2012 Definitions of Favourable Condition: Pewsey Downs SSSI (Available on request from Natural England) PAYNE, K.R. 1987. Management Plan for Pewsey Downs NNR. Nature Conservancy Council. (Available on request from Natural England) MASSEN, D & CASHMAN, P. 2003. *Management Plan for Pewsey Downs NNR.* English Nature. (Available on request from Natural England) Wiltshire Chalk Grassland NVC Survey 1989, Nature Conservancy Council. (Archived survey data available on request from Natural England) PAYNE K *1985 NVC Survey* Nature Conservancy Council. (Unpublished archived survey data available on request from Natural England) McSWEENEY P, *1991 Chalk grassland survey*, English Nature (Unpublished archived document available on request from Natural England)

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
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 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.	CRITCHLEY et al 2002 *Biol. Conserv.*, 105, 199-215, Defra commissioned research projects BD1451 (DIGFOR) and BD5001 (soil compaction)
Structure and function (including its typical species)	**Supporting off-site habitat**	Maintain the extent, quality and spatial configuration of land or habitat surrounding or adjacent to the site which is known to support the feature Where appropriate there should be buffer strips adjacent to the site to protect the species-rich grassland from the effects of pesticide drift and nutrient enrichment.	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. Corridors of suitable habitat will help link the site to nearby areas of species-rich grassland and facilitate movement of invertebrates, notably Lepidoptera. The site is part of the wider Pewsey Downs SSSI. There are also opportunities to link to other chalk grassland SSSIs such as Morgan's Hill and Calstone and Cherhill Downs and other species rich grassland via the Wansdyke linear Scheduled Monument.	RAGGETT, L. & LARGE, R., 2013. Mapping connectivity of species-rich grassland habitat in the Wiltshire Chalk landscape. A collaboration between the Stepping Stones project and Natural England's Vale of Pewsey Landscape-scale NNR Project. Natural England and Wiltshire Wildlife Trust report. (Available on request from Natural England) CLARKE, S. & GREEN, D. 2015. Pewsey Downs Landscape Marsh Fritillary and Duke of Burgundy breeding habitat survey Unpublished report for Natural England. GI database includes maps of existing chalk grassland.
Structure and function (including its typical species)	**Functional connectivity with wider landscape**	Maintain the overall extent, quality and function of any supporting features within the local landscape which provide a critical functional connection with the site. Important also for Marsh Fritillary butterfly and other species supported by the SAC grassland.	This recognises the potential need at this site to maintain or restore the connectivity of the site to its wider landscape in order to meet the conservation objectives. These connections may take the form of landscape features, such as habitat patches, hedges, watercourses and verges, outside of the designated site boundary which are either important for the migration, dispersal and genetic exchange of those typical species closely associated with qualifying Annex I habitat features of the site. These features may also be important to the operation of the supporting ecological processes on which	RAGGETT, L. & LARGE, R., 2013. Mapping connectivity of species-rich grassland habitat in the Wiltshire Chalk landscape. A collaboration between the Stepping Stones project and Natural England's Vale of Pewsey Landscape-scale NNR Project. Natural England and Wiltshire Wildlife Trust report

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			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.	CLARKE, S. & GREEN, D. 2015. Pewsey Downs Landscape Marsh Fritillary and Duke of Burgundy breeding habitat survey Unpublished report for Natural England. GI database includes maps of existing chalk grassland.
Structure and function (including its typical species)	**Adaptation and resilience**	Maintain 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. The overall vulnerability of this SAC to climate change has been assessed by Natural England (2015) as being low, taking into account the sensitivity, fragmentation, topography and management of its habitats. This means that this site is considered to be vulnerable overall but is a lower priority for further assessment and action. Individual species may be more or less vulnerable than their supporting habitat itself. In many cases, change will be inevitable so appropriate monitoring would be advisable.	Climate Change adaptation literature and manual; European Union 2013. Guidelines on climate change and Natura 2000; NATURAL ENGLAND, 2015. Climate Change Theme Plan and supporting National Biodiversity Climate Change Vulnerability assessments ('NBCCVAs') for SACs and SPAs in England [Available at http://publications.naturalengland.org.uk/publication/4954594591375360].

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Supporting processes (on which the feature relies)	**Air quality**	Maintain the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	This habitat type is considered sensitive to changes in air quality. Exceedance of these critical values for air pollutants may modify the chemical status of its substrate, accelerating or damaging plant growth, altering its vegetation structure and composition and causing the loss of sensitive typical species associated with it. Critical Loads and Levels are recognised thresholds below which such harmful effects on sensitive UK habitats will not occur to a significant level, according to current levels of scientific understanding. There are critical levels for ammonia (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.	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).
Supporting processes (on which the feature relies)	**Conservation measures**	Maintain the management measures (either within and/or outside the site boundary as appropriate) which are necessary to maintain the structure, functions and supporting processes associated with the feature	Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site. Further details about the necessary conservation measures for this site can be provided by contacting Natural England. This information will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, Site Management Strategies or Plans, the Views about Management Statement for the underpinning SSSI and/or management agreements.	NATURAL ENGLAND, 2005. Pewsey Down SSSI - Views About Management NATURAL ENGLAND, 2015. Site Improvement Plan: Pewsey Down SAC NATURAL ENGLAND, 2016. Pewsey Down National Nature Reserve (NNR) Management Plan (Available on request from Natural England)

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
				PAYNE, K.R. 1987. Management Plan for Pewsey Downs NNR. Nature Conservancy Council. (Available on request from Natural England) MASSEN, D & CASHMAN, P. 2003. *Management Plan for Pewsey Downs NNR.* English Nature. (Available on request from Natural England)
Version Control Advice last updated:				
Variations from national feature-framework of integrity-guidance: N/A				

Table 2: Supplementary Advice for Qualifying Features: S1654. *Gentianella anglica*; Early gentian

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Population (of the feature)	**Population abundance**	Maintain the abundance of the population at a level which is above the baseline population-size known or estimated at or soon after the time of SAC designation, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent. The baseline figure given at the time of the Standard Data Form in 1995-06 was 1001-10000 but the population has never been surveyed comprehensively. One subsite has been surveyed in 2017 as part of a resurvey, but only holds a small part of the total population. There are NNR records of 398 individuals on Walkers Hill and 70 individuals on Milk Hill in 1997.	Populations may fluctuate considerably from year to year, depending on habitat condition, weather, etc. Flowering performance may also vary between years, affecting the plant's visibility. This will ensure there is a viable population of the feature which is being maintained at or increased to a level that contributes as appropriate to its Favourable Conservation Status across its natural range in the UK. Due to the dynamic nature of population change, the target-value given for the population size or presence of this feature is considered to be the minimum standard for conservation/ restoration measures to achieve. This minimum-value may be revised where there is evidence to show that a population's size or presence has significantly changed as a result of natural factors or management measures and has been stable at or above a new level over a considerable period (generally at least 10 years). The values given here may also be updated in future to reflect any strategic objectives which may be set at a national level for this feature. Given the likely fluctuations in numbers over time, any impact-assessments should focus on the current size of the site's population, as derived from the latest known or estimated level established using the best available data. This advice accords with the obligation to avoid deterioration of the site or significant disturbance of the species for which the site is designated, and seeks to avoid plans or projects that may affect the site giving rise to the risk of deterioration. Similarly, where there is evidence to show that a feature has historically been more abundant than the stated minimum target and its current level, the ongoing capacity of the site to accommodate the feature at such higher levels in future should also be taken into account in any assessment. Unless otherwise stated, the population size or presence will be that measured using standard methods, such as peak mean counts or breeding surveys. This value is also provided recognising there will be inherent variability as a result of	NATURAL ENGLAND 2009/ 2012 Definitions of Favourable Condition: Pewsey Downs SSSI (Available on request from Natural England) NATURAL ENGLAND, 2016. Pewsey Down National Nature Reserve (NNR) Management Plan (Available on request from Natural England) WILSON, P and PRICE, D (Species Recovery Trust), 2017. Early gentian *Gentianella anglica*: Sample Survey of Sites in England. (Available on request from Natural England) PAYNE, K.R, Nature Conservancy Council. 1987. *Management Plan for Pewsey Downs NNR* and botanical survey data (Available on request from Natural England)

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.	
Population (of the feature)	**Population structure: presence of *Gentianella amarella, Gentianella x davidii* and 'intermediates'**	Maintain the presence of both *G. anglica and G. amarella. The* putative hybrid between the two (*G. x davidii*) is not known from the site	Intermixed populations have been recorded from many sites, with the hybrid recorded especially from sites near edge of range of *G. anglica*. Phenological differences (flowering time) usually helpful in distinguishing between *G. anglica* and autumn gentian *G. amarella*. Note: there is still some uncertainty about the extent to which these two species hybridise, or indeed whether the two species are actually one.	WILSON, P and PRICE, D (Species Recovery Trust), 2017. Early gentian *Gentianella anglica*: Sample Survey of Sites in England Wiltshire Botanical Society (2007/08), Pewsey Downs SSSI. Survey of rare plants for Natural England (Available on request from Natural England or Wiltshire Botanical Society)
Supporting habitat: extent and distribution	**Distribution of supporting habitat**	Maintain the distribution and continuity of the feature and its supporting habitat, including where applicable its component vegetation types and associated transitional vegetation types, across the site. Early gentian is associated with the CG2 grassland community (particularly sub-community CG2a)	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.	WILSON, P and PRICE, D (Species Recovery Trust), 2017. Early gentian *Gentianella anglica*: Sample Survey of Sites in England (Available on request from Natural England) Detailed locations and grid references found in Pewsey Downs SSSI Wiltshire Botanical Society Survey (2007/08). Distribution maps also available. This report also includes historical records from the NNR (Keith Payne maps dated 1984 and 1986). (Data available on request from Natural England) This attribute will be periodically monitored as part of Natural England's SSSI condition

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
				assessments. More recent Wiltshire Botanical Society records and NNR team surveillance records may be available NATURAL ENGLAND, 2016. *Pewsey Down National Nature Reserve (NNR) Management Plan* (Available from Natural England on request)
Supporting habitat: extent and distribution	**Extent of supporting habitat**	Maintain the total extent of the habitats which support the feature, associated with CG2 / well grazed CG3 Habitat = approx. 75 ha: suitable locations within this will depend on aspect, sward height and bare ground.	In order to contribute towards the objective of achieving an overall favourable conservation status of the feature at a UK level, it is important to maintain or if appropriate restore the extent of supporting habitats and their range within this SAC. The information available on the extent and distribution of supporting habitat used by the feature may be approximate depending on the nature, age and accuracy of data collection, and may be subject to periodic review in light of improvements in data. The early gentian population is found on Pewsey Downs East and West. It grows on bare ground or in thin turf that is kept open by a combination of rabbit or sheep-grazing and trampling by livestock on thin droughted soils. In dense turf it becomes shaded out and unable to compete with other more vigorous species.	WILSON, P and PRICE, D (Species Recovery Trust), 2017. Early gentian *Gentianella anglica:* Sample Survey of Sites in England. (Data available on request from Natural England) Detailed locations and grid references found in Pewsey Downs SSSI Wiltshire Botanical Society Survey (2007/08). Distribution maps also available. This report also includes historical records from the NNR (Keith Payne maps dated 1984 and 1986). (Data available on request from Natural England) This attribute will be periodically monitored as part of Natural England's SSSI condition assessments. *More recent Wiltshire Botanical Society records and NNR team*

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
				surveillance records may be available from the local Natural England Area team or Wiltshire Botanical Society. Wiltshire botanical Society records are also held by the Botanical Society of the British Isles (BSBI) and Wilts Biological Records Centre.
Supporting habitat: structure/ function	**Habitat structure and bare ground: regeneration/ colonisation niches**	Maintain patches of bare ground and an open-textured sward to provide creating suitable regeneration/colonisation niches. Bare ground should be in range c.5-10%.	Patches of suitable vegetation often occur in mosaics with less suitable areas, and generally associated with steeper slopes, more southerly aspects, thinner soils, heavier grazing or trampling. All available evidence points to need for there being plenty of bare ground in a short/tightly grazed open-textured sward. Many sites best described as 'sparsely vegetated'). Some evidence suggests that *G. anglica* tends to occur in microsites recovering after disturbance (whereas *G. amarella* may also occur as a pioneer in recently disturbed sites).	
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.	
Supporting habitat: structure/ function	**Substrate**	Maintain a substrate of skeletal drought-prone relatively infertile soils overlying calcareous bedrock (chalk or limestone), occasionally overlying lime-rich sand on coastal sand dunes, with a generally SE, S or SW aspect.	See above for floristic indicators that may indicate changes in soil nutrient status (increase in fertility).	
Supporting habitat: structure/ function	**Vegetation composition: negative indicators**	Maintain/ reduce the frequency/cover of the following undesirable species at or to acceptable levels which are not	This feature can be adversely affected by changes to the grass: herb ratio (increased grassiness), often in tandem with sward becoming 'thicker' (less bare ground) or more rank.	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)
		encouraged by changes in surface condition, soils, nutrient levels or changes to hydrology.; Cover of tall grasses, should typically not exceed about 10% Species favoured by increased soil fertility / agricultural improvement should be rare or absent. Agricultural weeds should be rare or absent.	Undesirable species include: *Brachypodium pinnatum, Bromopsis erecta, Avenula pubescens, Arrhenatherum elatius, Cirsium arvense, Cirsium vulgare, Urtica dioica, Rumex Crispus and Rumex obtustifolius.* Tall grasses e.g. *Brachypodium pinnatum, Bromopsis erecta, Avenula pubescens, Arrhenatherum elatius, Dactylis glomerata*, may be an indication of undergrazing and should typically not exceed about 10%. The first two may locally occur at higher cover in stands of CG4a and CG3a respectively. Other species may be favoured by increased soil fertility/agricultural improvement, e.g. *Lolium perenne, Holcus lanatus, Cynosurus cristatus, Trisetum flavescens, Trifolium repens* 'Agricultural weeds' such as *Cirsium arvense, Cirsium vulgare, Galium aparine, Plantago major, Rumex obtusifolius, Senecio jacobaea and Urtica dioica,* can be be indicators of bad management and loss/degradation of suitable habitat.	
Supporting habitat: structure/ function	**Vegetation height**	Maintain a sward typically in the range of 2-5cm, but may also occur in slightly taller swards (5-20cm) as long as these still have plenty of bare ground and an absence of 'grassy' dominants.	Swards usually require moderate to heavy grazing and/or trampling to keep them sufficiently short and open; but on some coastal sites, drought and exposure may be sufficient on their own to maitain suitable sward conditions. Grazing may be by rabbits, deer, sheep or cattle. Generally, rabbits and/or sheep preferred to cattle (see, e.g. Telfer 1994), although Wilson (2000) suggests for sites in Wilts that summer (April-October) cattle grazing at 1 animal/ha, plus less intensive grazing in the winter, is suitable for many sites, with sheep used in late summer to remove any excess grass growth. Sward height may vary from year to year, depending not only on stocking rates and timing but also on the weather.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Supporting habitat: structure/ function	**Vegetation structure and composition**	Maintain the area of suitable supporting habitat which is short (2-5 cm), tightly-grazed and trampled calcicolous grassland with typically 5-10% bare ground which corresponds to the	Vegetation composition of this feature can be variable, depending on habitat, aspect, management regime and underlying geology/soils, but the frequent presence of the following species tend to be positive indicators of suitable early gentian habitat in its usual CG2 NVC community: *Poterium sanguisorba, Cirsium acaule, Thymus praecox, Polygala*	WILSON, P and PRICE, D (Species Recovery Trust), 2017. Early gentian *Gentianella anglica*: Sample Survey of Sites in England (Data available on request from Natural England)

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		following NVC communities: CG 2a, 2b. Most frequent in short species-rich CG2 and CG2b.	*vulgaris, Carex flacca, Hippocrepis comosa, Blackstonia perfoliata, Linum catharticum, Leontodon hispidus, Pilosella officinarum, Ranunculus bulbosus.* Grasses such as *Avenula pratensis, A. pubescens, Brachypodium pinnatum, B. sylvaticum* and *Bromopsis erecta* may be frequent as an open grassy 'overstorey', but never abundant or dominant. Early gentain may often occur with autumn gentian *Gentianella amarella,* but the two species usually occupy different microsites and seasonal timings, although there may be considerable overlap on some sites.	Detailed locations and grid references found in Pewsey Downs SSSI Wiltshire Botanical Society Survey (2007/08). Distribution maps also available. This report also includes historical records from the NNR (Keith Payne maps dated 1984 and 1986). (Data available on request from Natural England) 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)	**Adaptation and resilience**	Maintain the feature's ability, and that of its supporting habitat, to adapt or evolve to wider environmental change, either within or external to the site	This recognises the increasing likelihood of natural habitat features to absorb or adapt to wider environmental changes. Resilience may be described as the ability of an ecological system to cope with, and adapt to environmental stress and change whilst retaining the same basic structure and ways of functioning. Such environmental changes may include changes in sea levels, precipitation and temperature for example, which are likely to affect the extent, distribution, composition and functioning of a feature within a site. The vulnerability and response of features to such changes will vary. Using best available information, any necessary or likely adaptation or adjustment by the feature and its management in response to actual or expected climatic change should be allowed for, as far as practicable, in order to ensure the feature's long-term viability. The overall vulnerability of this SAC to climate change has been assessed by Natural England (2015) as being low, taking into account the sensitivity, fragmentation, topography and management of its habitats.	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			This means that this site is considered to be vulnerable overall but is a lower priority for further assessment and action. Individual species may be more or less vulnerable than their supporting habitat itself. In many cases, change will be inevitable so appropriate monitoring would be advisable.	
Supporting processes (on which the feature and/or its supporting habitat relies)	**Air quality**	Maintain or, where necessary, restore concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	The supporting 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, 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. 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.	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).
Supporting processes (on which the feature and/or its supporting habitat relies)	**Conservation measures**	Maintain the management measures (either within and/or outside the site boundary as appropriate) which are necessary to maintain the structure, functions and supporting processes associated with the	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	NATURAL ENGLAND, 2005. Pewsey Down SSSI - Views About Management NATURAL ENGLAND, 2015. Site Improvement Plan: Pewsey Down SAC

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		feature and/or its supporting habitats.	Plan, site management strategies or plans, the Views about Management Statement for the underpinning SSSI and/or management agreements.	NATURAL ENGLAND, 2016. *Pewsey Down National Nature Reserve (NNR) Management Plan* (Available on request from Natural England) PAYNE, K.R, Nature Conservancy Council. 1987. *Management Plan for Pewsey Downs NNR.* (Available on request from Natural England) MASSEN, D & CASHMAN, P. 2003. *Management Plan for Pewsey Downs NNR.* English Nature. (Available on request from Natural England)
Supporting processes (on which the feature and/or its supporting habitat relies)	**Grazing pressure**	Maintain a grazing regime to keep the sward short (preferably 2-5cm)	Swards usually require moderate to heavy grazing and/or trampling to keep them sufficiently short and open; but on some coastal sites, drought and exposure may be sufficient on their own to maintain suitable sward conditions. Grazing may be by (any combination of) rabbits, deer, sheep or cattle. Generally, rabbits and/or sheep preferred to cattle (see, e.g. Telfer 1994), although Wilson (2000) suggests for sites in Wilts that summer (April-October) cattle grazing at 1 animal/ha, plus less intensive grazing in the winter, is suitable for many sites, with sheep used in late summer to remove any excess grass growth.	
Version Control Advice last updated:				
Variations from national feature-framework of integrity-guidance: water quality attribute removed as not relevant to this feature.				