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

East Devon Pebblebed Heaths Special Area of Conservation (SAC)
Site code: UK0012602

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About this document

This document provides Natural England's supplementary advice about the European Site Conservation Objectives relating to East Devon Pebblebed Heaths SAC. This advice should therefore be read together with the SAC Conservation Objectives available here.

This site also overlaps with East Devon Heaths SPA (UK9010121) and the SPA Conservation Objectives are available here.

This advice replaces a draft version dated 8 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	East Devon Pebblebed Heaths Special Area of Conservation (SAC)
Location	Devon
Site Map	The designated boundary of this site can be viewed here on the MAGIC website
Designation Date	1st April 2005
Qualifying Features	See section below
Designation Area	1119.94 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)	East Devon Pebblebed Heaths SSSI
Relationship with other European or International Site designations	The area of this SAC overlaps with the East Devon Heaths Special Protection Area.

Site background and geography

This SAC, better known as the Pebblebed Heaths, is located on a ridge running north from the Devon seaside resort of Exmouth and sits on the most South Westerly point of the East Devon Area of Outstanding Natural Beauty. The area is predominantly Lowland Heath but is interspersed with areas of Coniferous woodland. It is an important area for recreation activities such as dog walking and cycling and is extensively used by the Royal Marines at Lympstone for training purposes. The site is also rich in archaeological features and is exemplified by the well-known Woodbury fort. The SAC forms part of the Devon Redlands National Character Area (NCA Profile 148) characterised by its new red sandstone and Triassic Budleigh Salterton Pebble Beds which has contributed to the formation of the Heathland.

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**

This is the largest block of lowland heathland in Devon and is associated with various other mire communities. The wet element occupies the lower-lying areas and includes good examples of M16 *Erica tetralix – Sphagnum compactum* wet heath. Associated with the wet heath are the 21 breeding dragonfly species of which the Annex II species Southern damselfly *Coenagrion mercuriale* occurs. There is also an important assemblage of birds, including European nightjar *Caprimulgus europaeus*, Eurasian hobby *Falco subbuteo* and Dartford warbler *Sylvia undata*.

- **H4030. European dry heaths**

The East Devon Pebblebed Heaths in south-west England include extensive areas of lowland European dry heaths. This site has representative examples of H4 *Ulex gallii – Agrostis curtisii* heath, characterised by the presence of heather *Calluna vulgaris*, bell heather *Erica cinerea*, western gorse *Ulex gallii,* bristle bent *Agrostis curtisii*, purple moor-grass *Molinia caerulea*, cross-leaved heath *E. tetralix* and tormentil *Potentilla erecta*. The presence of plants such as cross-leaved heath illustrates the more oceanic nature of these heathlands, as this species is typical of wet heath in the more continental parts of the UK.

Qualifying Species:

- **S1044*. Coenagrion mercuriale;* Southern damselfly**

This site holds three relatively small populations representing southern damselfly *Coenagrion mercuriale* in the south-west of its range in England. These populations occur in wet flushes within the site, which the supporting habitats are M14 *Schoenus nigricans- Narthecium ossifragum* mire and M16 *Erica tetralix-Sphagnum compactum* wet heath.

This species is protected under Schedule 5 of the 1981 Wildlife and Countryside Act, as amended, which protects it against a variety of factors including killing or selling of individuals and damage or destruction of habitat. In Great Britain this species is classified as Rare (category 3) on the Red Data Book List.

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

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 the baseline-value of 127 hectares	There should be no measurable reduction (excluding any trivial loss) in the extent and area of this feature, and in some cases, the full extent of the feature may need to be restored. 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. Baseline habitat extents estimated using figures provided in Bangor University and Andrew McCarthy Associates NVC survey reports 2005 (see references) and undated Phase 1 maps.	Andrew McCarthy Associates (2006). NVC Survey of East Devon Pebblebed Heaths SSSI Units 8, 9 and 11. Unpublished report to Natural England (Available on request from Natural England) Mike Prosser and Hilary Wallace. 2006. National Vegetation Classification Pebblebed Heaths (In Part) Natural England (2013) Definition of favourable condition – East Devon Pebblebed Heaths SSSI (Available from Natural England on request)
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	As above Bridgewater, S. and Kerry, L (2016) EDPH Providing Space for Nature. Biodiversity Audit. (Available from Natural England on request)

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			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.	
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 are a lower priority for further assessment and action. Individual species may be more or less vulnerable than their supporting habitat itself. In many cases, change will be inevitable so appropriate monitoring would be advisable.	NATURAL ENGLAND, 2015. Climate Change Theme Plan and supporting National Biodiversity Climate Change Vulnerability assessments ('NBCCVAs') for SACs and SPAs in England

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Structure and function (including its typical species)	**Bare ground**	Restore the cover of bare ground within the H4010 feature to within 1-10%.	Warm, dry, bare substrate close to or within heathland vegetation is important as basking, hunting, nesting and burrowing sites for certain plants, invertebrates, birds and amphibians typically associated with dry heaths. Bare ground is defined here as soil (especially sandy, exposed soil in dry heaths and peaty soil besides open water in wet heaths, which is free of vegetation cover or litter and not subject to heavy and regular disturbance. It should be firm, sunlit, horizontal, sloping or vertical exposed bare ground. Target set to Restore because military training and public access are resulting in damaging erosion in a number of areas.	Natural England. 2014. Site Improvement Plan. East Devon Heaths.
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	This recognises the potential need at this site to maintain or restore the connectivity of the site to its wider landscape in order to meet the conservation objectives. These connections may take the form of landscape features, such as habitat patches, hedges, watercourses and verges, outside of the designated site boundary which are either important for the migration, dispersal and genetic exchange of those typical species closely associated with qualifying Annex I habitat features of the site. These features may also be important to the operation of the supporting ecological processes on which the designated site and its features may rely. In most cases increasing actual and functional landscape-scale connectivity would be beneficial. Where there is a lack of detailed knowledge of the connectivity requirements of the qualifying feature, Natural England will advise as to whether these are applicable on a case by case basis.	
Structure and function (including its typical species)	**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 H4010 habitat;	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	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)
		• Constant and preferential plant species of the M14: *Schoenus nigricans - Narthecium ossifragum* mire and M16 *Erica tetralix – Sphagnum compactum* wet heath NVC vegetation types at this SAC	habitat's structure or help to define that habitat on a particular SAC (see also the attribute for 'vegetation community composition'). • **Influential** species which are likely to have a key role affecting the structure and function of the habitat (such as bioturbators (mixers of soil/sediment), grazers, surface borers, predators or other species with a significant functional role linked to the habitat) • **Site-distinctive** species which are considered to be a particularly special and distinguishing component of an Annex I habitat on a particular SAC. There may be natural fluctuations in the frequency and cover of each of these species. The relative contribution made by them to the overall ecological integrity of a site may vary, and Natural England will provide bespoke advice on this as necessary. The list of species given here for this Annex I habitat feature at this SAC is not necessarily exhaustive. The list may evolve, and species may be added or deleted, as new information about this site becomes available. Other species associated with the wetter areas are bog asphodel *Narthecium ossifragum*, sundews *Rosera* spp., pale butterwort *Pinguicula lusitanica*, bog pimpernel *Anagallis tenella*, common cottongrass *Eriophorum angustifolium* and the club-moss *Lycopodiella inundata*	
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 • M14: *Schoneus nigricans - Narthecium ossifragum* mire • M16 *Erica tetralix* –	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	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)
		Sphagnum compactum wet heath	and preferential species of a community), and therefore that of the SAC feature, at appropriate levels (recognising natural fluctuations). The M14 and M16 communities are also found as a mosaic with M24 *Molinia caerulea – Cirsium dissectum* fen-meadow and M25 *Molinia caerulea – Potentilla erecta* mire	
Structure and function (including its typical species)	**Vegetation community transitions**	Maintain any areas of transition between this and communities which form other heathland-associated habitats, such as dry and humid heaths (H4 *Ulex gallii - Agrostis curtisii* heath), mires (M21 *Narthecium ossifragum - Sphagnum papillosum* valley mire, M24 *Molinia caerulea – Cirsium dissectum* fen-meadow and M25 *Molinia caerulea – Potentilla erecta* mire) and acid grasslands (U4 *Festuca ovina - Agrostris capillaris - Galium saxatile* grassland).	Transitions/zonation's between adjacent but different vegetation communities are usually related to naturally-occurring changes in soil, aspect or slope. Such 'ecotones' retain characteristics of each bordering community and can add value in often containing species not found in the adjacent communities. Retaining such transitions can provide further diversity to the habitat feature, and support additional flora and fauna. This is an important attribute as many characteristic heathland species utilise the transitions between vegetation types or use different vegetation types during different stages of their life cycle.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	**Vegetation composition: bracken cover**	Maintain a cover of dense bracken which is low, typically at <5% (dense canopy/litter)	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.	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 for NVC M14 and M16 at 40-90%. Dwarf-shrubs include: *Calluna vulgaris, Erica cinerea, E. tetralix, Ulex gallii and Vaccinium* spp.	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.	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)
			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*, and bilberry *Vaccinium myrtillus* are the commonest and most characteristic dwarf-shrubs. *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.	
Structure and function (including its typical species)	**Vegetation structure: cover of gorse**	Cover of common gorse is low typically at <10%	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.	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**	Maintain 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: • (pseudo) pioneer heathers: 10-40% cover • Building / mature heathers: 20 – 80% cover • Degenerate heathers: <30% • Dead heathers <10%	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments.
Structure and function (including its typical	**vegetation structure: tree cover**	Maintain the open character of the feature, with a typically scattered and low cover of trees and scrub (<10% 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	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)
species)			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	
Structure and function (including its typical species)	**Vegetation: undesirable species**	Maintain the frequency/cover of the following undesirable species at <1% and prevent changes in surface condition, soils, nutrient levels or hydrology which may encourage their spread; Acrocarpous mosses should be <occasional.	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. Undesirable species include: *Rhododendron ponticum, Gaultheria shallon, Fallopia japonica. Apium nodiflorum, Cirsium arvense, Digitalis purpurea, Epilobium spp. (excl. E. palustre), Glyceria fluitans, Juncus effusus, J. squarrosus, Oenanthe crocata, Phragmites spp., Ranunculus repens, Fallopia japonica, Senecio jacobaea, Rumex obtusifolius, Typha spp., Urtica spp. Alnus glutinosa, Betula spp., Prunus spinosa, Pinus spp., Rubus spp., Quercus spp.*	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments.
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 (NH_3), oxides of nitrogen (NO_x) and sulphur dioxide (SO_2), and critical loads for nutrient nitrogen deposition and acid	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk). Natural England. 2014. Site Improvement Plan. East Devon Heaths. Available from:

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			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. A restore target has been set as the critical loads for this feature are being exceeded on this site.	
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. For this feature, maintain low nutrient levels to maintain high numbers of species through the management activities of grazing, burning, mowing 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. A range of invertebrates and plants require bare ground/peat where it is not too frequently disturbed by vehicles or feet.	Natural England. 2014. Site Improvement Plan. East Devon Heaths. Pebblebed Heath Conservation Trust (2015). Management Plan 2015-2025. (Available on request from Natural England)
Supporting processes (on which the feature relies)	**Hydrology**	At a site level, 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	Natural England. 2014. Site Improvement Plan. East Devon Heaths.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			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. The Site Improvement Plan. East Devon Heaths highlights hydrology as an issue to 'investigate the potential impacts on hydrology of groundwater abstraction and localised recreational pressure particularly on the areas of wet heath and Mire'.	
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. Due to high recreational use eutrophication from dogs and horses may have a significant effect on this target. More needs to be known on the impacts of this heavy use. The Site Improvement Plan highlights high recreational use and eutrophication should make up part of the investigations into its impact.	Natural England. 2014. Site Improvement Plan. East Devon Heaths.
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	Environment Agency Catchment Data Explorer , 2016

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			cases more stringent standards may be needed. Further site-specific investigations may be required to establish appropriate water quality standards for the SAC. From reviewing the Environment Agencies Catchment Data Explorer the following water bodies within the SAC have the following classification and the reasons for not achieving good condition in 2016. • Squabmoor Reservoir – Moderate • Lower River Otter – Poor. Point and diffuse pollution and flow due to ground water abstraction. • Polly Brook – Poor. Point and diffuse pollution • Grimble Brook – Poor. Diffuse pollution and barriers to fish movements. Apart from Squabmoor Reservoir the other water courses are situated within the SAC near the head of source so in probability exists up-gradient of discharges or abstractions.	
Version Control Advice last updated: **13 March 2019**: Added '**bare ground**' attribute and further information about eutrophication in the '**Soils, substrate and nutrient cycling**' attribute **Variations from national feature-framework of integrity-guidance**: n/a				

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

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 of dry heath at 635 ha, estimates are made in 2012, based on 2005 NVC surveys	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.	Andrew McCarthy Associates (2006). NVC Survey of East Devon Pebblebed Heaths SSSI Units 8, 9 and 11. Unpublished report to Natural England (Available on request from Natural England) Mike Prosser and Hilary Wallace. 2006. National Vegetation Classification Pebblebed Heaths (In Part) Natural England (2013) Definition of favourable condition – East Devon Pebblebed Heaths SSSI (Available from Natural England on request)
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	Bridgewater, S. and Kerry, L (2016) EDPH Providing Space for Nature. Biodiversity Audit. (Available from Natural England on request)

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			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.	
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 are a lower priority for further assessment and action. Individual species may be more or less vulnerable than their supporting habitat itself. In many cases, change will be inevitable so appropriate monitoring would be advisable.	NATURAL ENGLAND, 2015. Climate Change Theme Plan and supporting National Biodiversity Climate Change Vulnerability assessments ('NBCCVAs') for SACs and SPAs in England
Structure and function (including its typical	**Bare ground**	Restore the cover of bare ground within the H4030 feature to within 1-10%.	Warm, dry, bare substrate close to or within heathland vegetation is important as basking, hunting, nesting and burrowing sites for certain plants, invertebrates, birds and amphibians typically associated with dry heaths.	Natural England. 2014. Site Improvement Plan. East Devon Heaths.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
species)			Bare ground is defined here as soil (especially sandy, exposed soil in dry heaths and peaty soil besides open water in wet heaths, which is free of vegetation cover or litter and not subject to heavy and regular disturbance. It should be firm, sunlit, horizontal, sloping or vertical exposed bare ground. Target set to Restore because military training and public access are resulting in damaging erosion in a number of areas.	
Structure and function (including its typical species)	**Functional connectivity with wider landscape**	Restore the overall extent, quality and function of any supporting features within the local landscape which provide a critical functional connection with the site	This recognises the potential need at this site to maintain or restore the connectivity of the site to its wider landscape in order to meet the conservation objectives. These connections may take the form of landscape features, such as habitat patches, hedges, watercourses and verges, outside of the designated site boundary which are either important for the migration, dispersal and genetic exchange of those typical species closely associated with qualifying Annex I habitat features of the site. These features may also be important to the operation of the supporting ecological processes on which the designated site and its features may rely. In most cases increasing actual and functional landscape-scale connectivity would be beneficial. Where there is a lack of detailed knowledge of the connectivity requirements of the qualifying feature, Natural England will advise as to whether these are applicable on a case by case basis. Outside of the SAC there are important areas of Lowland Heath with as good quality as the designated habitat. These areas have surveyed records up to 2018 of Dartford Warbler and Nightjar both notified features within the SPA. Within the SAC there is up to 300ha of woodland and scrub that is an important component to the Dry Lowland Heath, it provides nesting, feeding and songposts for the breeding birds that are found on this site.	Natural England. 2014. Site Improvement Plan. East Devon Heaths. Pebblebed Heath Conservation Trust (2015). Management Plan 2015-2025. (Available on request from Natural England)
Structure and function (including its typical	**Soils, substrate and nutrient cycling**	Maintain the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status	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	Natural England. 2014. Site Improvement Plan. East Devon Heaths.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
species)		and fungal: bacterial ratio, to within typical values for the habitat.	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. Due to high recreational use eutrophication from dogs and horses may have a significant effect on this target. More needs to be known on the impacts of this heavy use. The Site Improvement Plan highlights high recreational use and eutrophication should make up part of the investigations into its impact.	
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 H4 *Ulex gallii - Agrostis curtisii* heath and H8 *Calluna vulgaris - Ulex gallii* heath NVC vegetation types at this SAC • Silver-studded Blue *Plebejus argus*	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,	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 species may be added or deleted, as new information about this site becomes available.	
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: • H4 *Ulex gallii - Agrostis curtisii* heath • H8 *Calluna vulgaris - Ulex gallii* 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). 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) There are some areas currently dominated by tall gorse or dry acid grassland U4 and U20 (following gorse and bracken clearance) that may move in the direction of H4 as succession from grassland occurs).	Baseline habitat extents estimated using figures provided in Bangor University and Andrew McCarthy Associates NVC survey reports 2005 (see references) and undated Phase 1 maps. Andrew McCarthy Associates (2006). NVC Survey of East Devon Pebblebed Heaths SSSI Units 8, 9 and 11. Unpublished report to Natural England (Available on request from Natural England) Mike Prosser and Hilary Wallace. 2006. National Vegetation Classification Pebblebed Heaths (In Part) Natural England (2013) Definition of favourable condition – East Devon Pebblebed Heaths SSSI (Available from Natural England on request)
Structure and function (including its typical species)	**Vegetation community transitions**	Maintain any areas of transition between this and communities which form other heathland-associated habitats, such as wet heaths (M14 *Schoenus nigricans - Narthecium ossifragum* mire and M16 *Erica tetralix – Sphagnum compactum* wet heath), mires (M21 *Narthecium ossifragum - Sphagnum papillosum* valley mire, M24	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.	Natural England (2013) Definition of favourable condition – East Devon Pebblebed Heaths SSSI (Available from Natural England on request)

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		Molinia caerulea – Cirsium dissectum fen-meadow and M25 *Molinia caerulea – Potentilla erecta* mire), acid grassland (U4 *Festuca ovina - Agrostis capillaris - Galium saxatile* grassland), and scrub (U20 *Pteridium aquilinum - Galium saxatile* community) .		
Structure and function (including its typical species)	**Vegetation composition: bracken cover**	Maintain 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.	As above 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 60-90% In areas supporting silver-studded blue butterfly the higher bare ground target means dwarf shrub cover is <75%. For Dartford warbler >75% dwarf scrub cover is preferred.	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). The ericaceous species heather or ling *Calluna vulgaris*, bell heather Erica cinerea, cross-leaved heath *Erica tetralix*, and bilberry *Vaccinium myrtillus* are the commonest and most characteristic dwarf-shrubs. *Calluna* is usually the most abundant. Western gorse *Ulex gallii* is an important component of H4 and	Natural England (2013) Definition of favourable condition – East Devon Pebblebed Heaths SSSI (Available from Natural England on request) 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)
			is abundant along with *Calluna*. It is included along with the other species as part of the species cover within the SSSI condition assessments. The Definition of Favourable condition lists the SSSI units this is relevant to	
Structure and function (including its typical species)	**Vegetation structure: cover of gorse**	Maintain cover of common gorse Ulex europaeus at <25% and the combined cover of *U. europaeus* and *U. gallii* at <40% For Dartford Warbler maintain >5% but <25% *Ulex europaeus* or Western gorse *Ulex gallii*	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.	As above 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**	Maintain 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: • (pseudo) pioneer heathers: 10-40% cover • Building / mature heathers: 20 – 80% cover • Degenerate heathers: <30% • Dead heathers <10%	As above 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**	Maintain 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.	As above 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)
			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 Tree and scrub spp include: *Betula spp., Prunus spinosa, Pinus spp., Quercus spp., Rubus spp*. and *Sarothamnus scopariu*. Occasional isolated trees or standing deadwood, away from disturbed areas, are required as nightjar song posts.	
Structure and function (including its typical species)	**Vegetation: undesirable species**	Maintain the frequency/cover of the following undesirable and / or exotic species at <1% and prevent changes in surface condition, soils, nutrient levels or hydrology which may encourage their spread. *Acrocarpous* mosses < occasional	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. Undesirable / exotic species include: *Cirsium arvense, Digitalis purpurea, Epilobium spp. (excluding. E. palustre), Chamerion angustifolium, Juncus effusus, J. squarrosus, Ranunculus spp., Senecio spp., Rumex obtusifolius, Urtica dioica. Rhododendron ponticum* and *Fallopia japonica*	As above This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
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 (NH_3), oxides of nitrogen (NO_x) and sulphur dioxide (SO_2), and critical loads for nutrient nitrogen deposition and acid	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk). Natural England. 2014. Site Improvement Plan. East Devon Heaths.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			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. A restore target has been set as the critical loads for this feature are exceeded on this SAC	
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. Management of this feature may include maintenance of low nutrient levels to maintain high numbers of species through the management activities of grazing, burning, 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. A range of invertebrates and plants require bare ground/peat where it is not too frequently disturbed by vehicles or feet.	Natural England. 2014. Site Improvement Plan. East Devon Heaths. Pebblebed Heath Conservation Trust (2015). Management Plan 2015-2025. (Available on request from Natural England)
Supporting processes (on which the feature relies)	**Hydrology**	At a site, unit, catchment level as appropriate, 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	Natural England. 2014. Site Improvement Plan. East Devon Heaths.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			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. The Site Improvement Plan. East Devon Heaths highlights hydrology as an issue to 'investigate the potential impacts on hydrology of groundwater abstraction and localised recreational pressure particularly on the areas of wet heath and Mire'. The wet heath and mire cannot be looked at in isolation and any proposals affecting this attribute must always consider the hydrology on the Dry Heath.	
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. From reviewing the Environment Agencies Catchment Data Explorer the following water bodies within the SAC have the following classification and the reasons for not achieving good condition in 2016. • Squabmoor Reservoir – Moderate • Lower River Otter – Poor. Point and diffuse pollution and flow due to ground water abstraction. • Polly Brook – Poor. Point and diffuse pollution • Grimble Brook – Poor. Diffuse pollution and barriers to fish movements.	Environment Agency Catchment Data Explorer, 2016

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			Apart from Squabmoor Reservoir the other water courses are situated within the SAC near the head of source so in probability exists up-gradient of discharges or abstractions.	
Version Control Advice last updated: **13 March 2019**: Added '**bare ground**' attribute and further information about eutrophication in the '**Soils, substrate and nutrient cycling**' attribute **Variations from national feature-framework of integrity-guidance**:n/a				

Table 3: Supplementary Advice for Qualifying Features: S1044. *Coenagrion mercuriale*; Southern damselfly

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 80 adults, 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. This minimum-value may be revised where there is evidence to show that a population's size or presence has significantly changed as a result of natural factors or management measures and has been stable at or above a new level over a considerable period. The values given here may also be updated in future to reflect any strategic objectives which may be set at a national level for this feature. Given the likely fluctuations in numbers over time, any impact-assessments should focus on the current size of the site's population, as derived from the latest known or estimated level established using the best available data. This advice accords with the obligation to avoid deterioration of the site or significant disturbance of the species for which the site is designated, and seeks to avoid plans or projects that may affect the site giving rise to the risk of deterioration. Similarly, where there is evidence to show that a feature has historically been more abundant than the stated minimum target and its current level, the ongoing capacity of the site to accommodate the feature at such higher levels in future should also be taken into account in any assessment. 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	Natural England (2013) Definition of favourable condition – East Devon Pebblebed Heaths SSSI (Available from Natural England on request) Jon Webb, *pers comm* Natural England - Senior Specialist (Entomology)

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			recognising there will be inherent variability as a result of natural fluctuations and margins of error during data collection. Whilst we will endeavour to keep these values as up to date as possible, local Natural England staff can advise that the figures stated are the best available. Surveys are carried out by British Dragonfly Society on this site annually. Numbers vary widely due to the two year lifecycle of this species. The Southern Damselfly maximum counts drop every few years. Where there is a sustained trough in population below the 80 maximum count for at least four years, this should flag up the need for concern and further investigation.	
Supporting habitat: extent and distribution	**Distribution of supporting habitat**	Maintain the distribution and continuity of the feature and its supporting habitat, including where applicable its component vegetation types and associated transitional vegetation types, across the site	A contraction in the range, or geographic spread, of the feature (and its component vegetation) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. Contraction may also reduce and break up the continuity of a habitat within a site and how well the species feature is able to occupy and use habitat within the site. Such fragmentation may have a greater amount of open edge habitat which will differ in the amount of light, temperature, wind, and even noise that it receives compared to its interior. These conditions may not be suitable for this feature and this may affect its viability.	
Supporting habitat: extent and distribution	**Extent of supporting habitat**	Maintain the total extent of the habitats which support the feature. This species is found on wet heath and mires, the extent of supporting habitat is 4.61ha.	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 extent of the habitat is small due to the small population and distribution of the species. The species are found on SSSI	Natural England (2013) Definition of favourable condition – East Devon Pebblebed Heaths SSSI (Available from Natural England on request) Pebblebed Heath Conservation Trust (2015). Management Plan 2015-2025. (Available on request from Natural England) .

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			units 2 (re-introduced), 7 and 9.	
Supporting habitat: structure/ function	**Flow: base-rich runnels and heathland seepages/streams**	Maintain open, unshaded, shallow lengths of watercourse/mire with permanent discernible flow (approx. 10 cm s-1).	The southern damselfly requires base-rich, shallow streams with a constant slow-to-moderate permanent flow and relatively high water temperature. Scrub can shade up to 20% of the runnels, and not interrupting lengths of runnels shorter than 50m, in order to allow adult movements.	Natural England (2013) Definition of favourable condition – East Devon Pebblebed Heaths SSSI (Available from Natural England on request)
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: Base-rich runnels and heathland seepages/ streams**	Maintain not less than 50% cover of peaty silt or other organic substrate in watercourse/mire.	The preferred supporting habitat substrate is an inorganic substrate overlaid with shallow organic peat or silt	Natural England (2013) Definition of favourable condition – East Devon Pebblebed Heaths SSSI (Available from Natural England on request) This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Supporting habitat: structure/ function	**Trophic conditions :Base-rich runnels and heathland seepages/ streams**	Maintain dystrophic to mesotrophic conditions indicated by a lack of areas of watercourse with encroachment of algae (except brown flocculent algae), bacterial film or invasive tall emergents such as *Juncus effusus, J. acuitiflorus* and *Phragmites* spp.	A wide range of pH is found in watercourses on southern damselfly sites, although the majority of sites fall within the range 7.0–7.5. These conditions ensure sufficient oxygen for larval and egg development and no eutrophication and encroachment of invasive emergents and algae.	
Supporting habitat: structure/	**Vegetation composition: Base-rich**	Maintain stream lengths with cover of submerged and semi-emergent, herbaceous	The southern damselfly usually emerges from the water as final instar larvae by ascending emergent vegetation, rather than by walking onto shore. Tall rushes and sedges are known to have	Natural England (2013) Definition of favourable condition – East Devon Pebblebed Heaths SSSI

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
function	**runnels and heathland seepages /streams**	macrophytes including some cover of *Hypericum elodes, Potamogeton polygonifolius, or Ranunculus flammula,* with some *Carex spp. or Juncus* spp	been used and emergence perches for the southern damselfly include semi-emergent plants such as lesser water parsnip *Berula erecta*, bittersweet *Solanum dulcamara*, water mint *Mentha aquatica* and watercress *Rorippa nasturtium-aquaticum*. Ideal emergence perches are likely to be plants with rigid stems that would not bend in the wind. The damselfly's wings and abdomen were less likely to be damaged if they did not touch surrounding vegetation during expansion and drying. The eggs are laid into water plant tissue and plant species used as oviposition substrates may include fool's watercress *Apium nodiflorum*, lesser water parsnip, reed sweet-grass *Glyceria maxima*, watercress, brooklime *Veronica beccabunga* and blue water-speedwell *V. anagallis-aquatica*, marsh St John's wort *Hypericum elodes*, bog pondweed *Potamogeton polygonifolius* and jointed rush *Juncus articulatus.* Supporting habitats *M14 Schoenus nigricans- Narthecium ossifragum* mire and M16 *Erica tetralix-Sphagnum compactum* wet heath	(Available from Natural England on request)
Supporting habitat: structure/ function	**Vegetation composition: scrub cover**	Maintain only small areas of tall scrub or trees within 20 metres of watercourse or mire but not on intervening habitat between two areas of population.	Some scattered trees and scrub associated with base-rich runnels and heathland seepages/streams can provide areas for roosting, maturation, feeding, displaying and basking.	Natural England (2013) Definition of favourable condition – East Devon Pebblebed Heaths SSSI (Available from Natural England on request)
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.	Natural England, 2015. Climate Change Theme Plan and supporting National Biodiversity Climate Change Vulnerability assessments ('NBCCVAs') for SACs and SPAs in England

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			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 are a lower priority for further assessment and action. Individual species may be more or less vulnerable than their supporting habitat itself. In many cases, change will be inevitable so appropriate monitoring would be advisable. Within this SAC, the Southern Damselfly is at the northern edge of its range and is unlikely to be affected by any increases in temperature; the primary impact of climate change on this species will be through changes to hydrology of a site.	
Supporting processes (on which the feature and/or its supporting habitat relies)	**Air quality**	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 (NH_3), oxides of nitrogen (NO_x) and sulphur dioxide (SO_2), 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.	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System www.apis.ac.uk Natural England. 2014. Site Improvement Plan. East Devon Heaths.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			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. A restore target has been set as the critical load levels for the feature are exceeded on this site.	
Supporting processes (on which the feature and/or its supporting habitat relies)	**Conservation measures**	Maintain the management measures (either within and/or outside the site boundary as appropriate) which are necessary to maintain the structure, functions and supporting processes associated with the feature and/or its supporting habitats.	Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site. Further details about the necessary conservation measures for this site can be provided by contacting Natural England. This information will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, site management strategies or plans, the Views about Management Statement for the underpinning SSSI and/or management agreements. The Southern Damselfly has very particular habitat requirements for a mid-successional management dependent habitat. It is important to ensure that sites holding Southern Damselfly populations are managed according to these requirements, as well as potentially suitable adjacent land. Due to their limited dispersal ability, only small areas of the watercourse should be managed in any one year. In addition, potentially suitable areas close to existing populations or between current populations can be managed to reconnect them.	Natural England (2013) Definition of favourable condition – East Devon Pebblebed Heaths SSSI (Available from Natural England on request) British Dragonfly Society (2016) – Southern Damselfly Management Handbook
Supporting processes (on which the feature and/or its supporting habitat relies)	**Water quantity/ quality**	Where the feature or its supporting habitat is dependent on surface water and/or groundwater, maintain water quality and quantity to a standard which provides the necessary conditions to support the feature.	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.	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			Typically, meeting the surface water and groundwater environmental standards set out by the Water Framework Directive (WFD 2000/60/EC) will also be sufficient to support the achievement of SAC Conservation Objectives but in some cases more stringent standards may be needed to reflect the ecological needs of the species feature. Further site-specific investigations may be required to establish appropriate water quality standards for the SAC.	
Version Control Advice last updated: n/a				
Variations from national feature-framework of integrity-guidance: Attributes relating to chalk streams and river attributes removed as the habitat on this site is found on wet heath and mires within runnels.				